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BOMBAY BRANCH
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Class

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LIST

OF THE

SHELLS OF CUBA

IN

THE COLLECTION

OF THE

BRITISH MUSEUM,

COLLECTED BY

M. RAMON DE LA SAGRA.

DESCRIBED BY

PROF. ALCIDE D'ORBIGNY,

In the "Histoire de l'Ile de Cuba."

33259

LONDON:

PRINTED BY ORDER OF THE TRUSTEES.

1854.

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

PREFACE.

THE specimens of SHELLS in the following list marked B.M. were received from Professor Alcide d'Orbigny, as the type specimens described by him in the Mollusca part of the "Histoire physique, politique et naturelle de l'Ile de Cuba, par M. Ramon de la Sagra, Directeur du Jardin botanique de la Havane, Correspondant de l'Institut Royal de France." Paris, 8vo, with a folio Atlas.

The specimens are on their original cartoons, named by M. d'Orbigny, and marked with their special habitats.

JOHN EDWARD GRAY.

Sept. 1, 1854.

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LIST

OF THE

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Class I.

CEPHALOPODA CRYPTODIBRANCHIATA.

Order I. ACETABULIFERA.

Suborder I. Octopoda.

Fam. 1. OCTOPIDÆ.

1. Octopus vulgaris, *Linn.*, *Ramon de la Sagra, Moll.* 11. t. 1. f. 1.

   Sepia octopodia, *Linn.*
   Polypus octopodia, *Leach.*
   Octopus appendiculatus, *Blainv.*

2. Octopus tuberculatus, *Blainv.*, *Ramon de la Sagra, Moll.* 15.

   Octopus ruber, *Rafinq.*?

3. Octopus rugosus, *d'Orb.*, *Ramon de la Sagra, Moll.* 18.

Sepia rugosa, *Bosc.*
Octopus granulatus, *Lamk.*
Sepia granulosa, *Bosc.*
Octopus Bakeri, *Féruss.*
Octopus americanus, *Blainv.*

4. Philonexis Quoyanus, *d'Orb.*, *Ramon de la Sagra, Hist. de Cuba*, 21.

5. Argonauta Argo, *Linn.*, *Sagra, Cuba*, 24.

Ocythöe tuberculata, *Rafinq.*
Ocythoë antiquorum, *Leach.*
Octopus antiquorum, *Blainv.*

6. Argonauta hians, *Solander, Sagra, Cuba*, 28.

Argonauta nitida, *Lamk.*

Suborder II. Decapoda.

Division I. Myopsidæ.

Fam. 1. SEPIDÆ.

7. Cranchia scabra, *Leach, Sagra, Cuba*, 32.

Loligo cranchie, *Blainv.*

8. Sepia Antillarum, *d'Orb.*, *Sagra, Cuba*, 33.

Fam. 2. LOLIGIDÆ.

9. Sepioteuthis sepioidea, *d'Orb.*, *Sagra, Cuba*, 34.

Sepia officinalis *β.*, *Lamk.*
Loligo sepioidea, *Blainv.*
Sepioteuthis Blainvilliana, *Féruss.*
Sepia affinis, *Féruss.*
Sepia biserialis, *Blainv.*
Sepioteuthis biangulata, *Rang.*

10. LOLIGO BRASILIENSIS, *Blainv.*, *Sagra, Cuba*, 38.
Loligo Poëyanus, *Féruss.*

11. LOLIGO PLEI, *Blainv.*, *Sagra, Cuba*, 42.

Fam. 3. TEUTHIDÆ.

12. ONYCHOTEUTHIS BERGII, *Licht.*, *Sagra, Cuba*, 46.
Onykia angulata, *Lesueur.*
Loligo Bartlingii, *Lesueur.*
Loligo Bergii, *Blainv.*
Loligo felina, *Blainv.*
Loligo angulata, *Blainv.*
Loligo uncinata, *Quoy.*
Onychoteuthis Lessonii, *Féruss.*
Onychoteuthis Fleuryi, *Beynaud.*

13. ONYCHOTEUTHIS CARDIOPTERA, *d'Orb.*, *Sagra, Cuba*, 53.
Loligo cardioptera, *Peron.*
Cranchia cardioptera, *Féruss.*

14. ONYCHOTEUTHIS CARAIBÆA, *d'Orb.*, *Sagra, Cuba*, 57.
Onychia caraibæa, *Lesueur.*
Loligo caraibea, *Blainv.*

15. OMMASTREPHES BARTRAMII, *d'Orb.*, *Sagra, Cuba*, 59.
Loligo Bartramii, *Lesueur.*
Loligo sagittata, *Blainv.*

Fam. 4. SPIRULIDÆ.

16. SPIRULA FRAGILIS, *Lamk.*, *Sagra, Cuba*, 64.
Lituus minor, *Browne.*
Nautilus spirula, *Schroeder.*
Spirula prototypus, *Peron.*
Spirula Peronii, *Lamk.*

Class II. PTEROPODA.

Fam. 1. HYALIDÆ.

17. HYALÆA TRIDENTATA, *Bosc, Sagra, Cuba,* 72.
Anomia tridentata, *Gmelin.*
Cavolina natans, *Abildg.*
Hyalæa papilionacea, *Bory.*
Hyalæa cornea, *Roissy.*
Hyalæa Forskalii, *Lesueur.*

18. HYALÆA UNCINATA, *Rang, Sagra, Cuba,* 73. t. 11. f. 1, 4.

19. HYALÆA GIBBOSA, *Rang, Sagra, Cuba,* 74.

20. HYALÆA QUADRIDENTATA, *Lesueur, Sagra, Cuba,* 75.

21. HYALÆA LONGIROSTRA, *Lesueur, Sagra, Cuba,* 76.

22. HYALÆA LIMBATA, *d'Orb., Sagra, Cuba,* 77. t. 2. f. 5, 8.

23. HYALÆA LABIATA, *d'Orb., Sagra, Cuba,* 78. t. 9, 12.

24. HYALÆA INFLEXA, *Lesueur, Sagra, Cuba,* 79.

25. HYALÆA TRISPINOSA, *Lesueur, Sagra, Cuba,* 80.

26. CLEODORA CUSPIDATA, *Rang, Sagra, Cuba,* 82.
Hyalæa cuspidata, *Bosc.*
Cleodora Lessonii, *Rang.*
Cleodora quadrispinosa, *Rang.*

27. CLEODORA PYRAMIDATA, *d'Orb., Sagra, Cuba,* 83.
Clio pyramidata, *Browne.*
Clio caudata, *Browne.*
Hyalæa pyramidata, *Bosc.*
Hyalæa caudata, *Roissy.*
Hyalæa lanceolata, *Lesueur.*

28. CRESEIS SUBULA, *d'Orb., Sagra, Cuba,* 85.
Cleodora subula, *Quoy.*
Cleodora spinifera, *Rang.*
Hyalæa subula, *d'Orb.*

29. CRESEIS VIRGULA, *Rang, Sagra, Cuba,* 86.

30. CRESEIS CORNIFORMIS, *d'Orb., Sagra, Cuba,* 87.

31. CRESEIS STRIATA, *Rang, Sagra, Cuba,* 87.

32. CRESEIS ACICULATA, *Rang, Sagra, Cuba,* 88.
Creseis clava, *Rang.*

33. CUVIERIA OBTUSA, *d'Orb., Sagra, Cuba,* 89.
Cleodora obtusa, *Quoy.*
Cuvieria columella, *Rang.*

Class III. GASTEROPODA.

Order I. NUCLEOBRANCHIA.

Fam. 1. ATLANTIDÆ.

34. HELICOPHLEGMA KERAUDRENII, *d'Orb., Sagra, Cuba,* 99.
Atlanta Keraudrenii, *Rang.*

35. HÉLICOPHLEGMA CANDEI, *d'Orb., Sagra, Cuba,* 100. t. 11. f. 15, 17.

36. ATLANTA PERONII, *Lesueur, Sagra, Cuba,* 102.
Corned Ammon, *Lamanon.*

37. HELICONOIDES INFLATA, *d'Orb., Sagra, Cuba,* 103.
Atlanta inflata, *d'Orb.*

38. HELICONOIDES TROCHIFORMIS, *d'Orb., Sagra, Cuba,* 104.
Atlanta trochiformis, *d'Orb.*

39. Heliconoides bulimoides, *d'Orb., Sagra, Cuba,* 104.

Atlanta bulimoides, *d'Orb.*

Order II. NUDIBRANCHIA.

Fam. 1. EOLIDÆ.

40. Glaucus radiatus, *d'Orb., Sagra, Cuba,* 109. t. 111.

Doris radiata, *Gmelin.*
Glaucus atlanticus, *Forster.*
Glaucus hexapterigius, *Cuvier.*
Glaucus australis, *Peron.*
Glaucus Forsteri, *Lamk.*
Glaucus tetrapterigius, *Rang.*
Glaucus pacificus, G. Boscii et G. Peronii, *Lesson.*
Scyllæa margaritacea, *Bosc.*

Order III. TECTIBRANCHIA.

Fam. 1. APLYSIDÆ.

41. Aplysia protea, *Rang, Sagra, Cuba,* 117.

42. Notarchus Pleii, *Rang, Sagra, Cuba,* 118.

Fam. 2. BULLIDÆ.

43. Bullæa Candeana, *d'Orb., Sagra, Cuba,* 119. t. 4. f. 1, 4. B.M.

44. Bulla ampulla, *Linn., Sagra, Cuba,* 121. B.M.

45. Bulla striata, *Brug., Sagra, Cuba,* 122. B.M.

Bulla ampulla, *Linn.*

46. Bulla Sagra, *d'Orb., Sagra, Cuba,* 123. t. 4. f. 5, 8. B.M.

47. Bulla Antillarum, *d'Orb., Sagra, Cuba,* t. 4. f. 9, 12. B.M.

48. BULLA BIDENTATA, *d'Orb., Sagra, Cuba,* 125. t. 4. f. 13, 16. B.M.

49. BULLA ACUTA, *d'Orb., Sagra, Cuba,* 126. t. 4. f. 17, 20. B.M.

50. BULLA CARIBÆA, *d'Orb., Sagra, Cuba,* 127. t. 4. f. 21, 24. B.M.

51. BULLA AUBERII, *d'Orb., Sagra, Cuba,* 127. t. 4 *bis*, f. 5, 8. B.M.

52. BULLA CANDEI, *d'Orb., Sagra, Cuba,* 128. t. 4 *bis*, f. 1, 4. B.M.

53. BULLA SULCATA, *d'Orb., Sagra, Cuba,* 129. t. 4 *bis*, f. 9, 21. B.M.

54. BULLA PETITII, *d'Orb., Sagra, Cuba,* 130. t. 4 *bis*, f. 13, 16. B.M.

55. BULLA RECTA, *d'Orb., Sagra, Cuba,* 131. t. 4 *bis*, f. 17, 20. B.M.

56. BULLA PHYSIS, *Linn., Sagra, Cuba,* 131. B.M.

57. BULLA UNDATA, *Brug., Sagra, Cuba,* 132. B.M.
Bulla physis, *Gmelin.*
Bulla nitidula, *Dillw.*
Bulla Ferussaci, *Quoy & Gaim.*

58. BULLA CANICULATA, *d'Orb., Sagra, Cuba,* 133. t. 4 *bis*, f. 21, 24. B.M.

Order IV. PULMOBRANCHIA.

Fam. 1. LIMACIDÆ.

59. VAGINULUS SLOANII, *Fér., Sagra, Cuba,* 139.

Fam. 2. COLIMACIDÆ.

60. SUCCINEA SAGRA, *d'Orb., Sagra, Cuba,* 141. t. 8. f. 1, 2, 3. B.M.

61. HELIX RAMONIS, *d'Orb., Sagra, Cuba,* 142. t. 8. f. 1, 4. B.M.

62. HELIX AURICOMA, *Féruss., Sagra, Cuba,* 143. t. 5. f. 4, 7. B.M.

H. microstoma, *Lamk.*

63. HELIX PETITIANA, *d'Orb., Sagra, Cuba,* 144. t. 9. f. 1, 2, 3. B.M.

64. HELIX SAGRAIANA, *d'Orb., Sagra, Cuba,* 145. t. 7. f. 4, 6. B.M.

65. HELIX PARRAIANA, *d'Orb., Sagra, Cuba,* 146. t. 7. f. 7, 9. B.M.

66. HELIX CIRCUMTEXTA, *Féruss., Sagra, Cuba,* 147. t. 9. f. 4, 6, 7.

Helix multistriata, *Desh.*

67. HELIX BONPLANDI, *Lamk., Sagra, Cuba,* 148. t. 7. f. 10, 12. B.M.

68. HELIX ALAUDA, *Féruss., Sagra, Cuba,* 149. t. 9. f. 8, 10. B.M.

69. HELIX POËYI, *Petit, Sagra, Cuba,* t. 5. f. 11, 13. B.M.

70. HELIX MARGINATA, *Müller, Sagra, Cuba,* t. 4. f. 11, 13.

71. HELIX MARGINATOIDES, *d'Orb., Sagra, Cuba,* t. 5. f. 8, 10. B.M.

Helix emarginata, *Féruss.*

72. HELIX MARGINELLOIDES, *d'Orb., Sagra, Cuba,* 154. t. 9. f. 14, 16. B.M.

Helix marginata, *Féruss.* var.

73. HELIX PISANOIDES, *d'Orb., Sagra, Cuba,* 155. t. 10. f. 1, 4.

74. HELIX PYRAMIDATOIDES, *d'Orb., Sagra, Cuba,* 156. t. 8. f. 5, 8. B.M.

75. HELIX AUBERII, *d'Orb., Sagra, Cuba,* 157. t. 7. f. 13, 16. B.M.

76. HELIX GILVA, *Féruss., Sagra, Cuba,* 157. t. 8. f. 9, 15. B.M.

77. HELIX CARNICOLOR, *Féruss., Sagra, Cuba,* 158. t. 10. f. 5, 8.
Helix pisana, *Chemn.?*

78. HELIX LANIERIANA, *d'Orb., Sagra, Cuba,* 159. t. 7. f. 17, 20. B.M.

79. HELIX PICTA, *Born, Sagra, Cuba,* 160. t. 5. f. 1, 2, 3. B.M.

80. HELIX NITENSOIDES, *d'Orb., Sagra, Cuba,* 161. t. 10. f. 9, 12. B.M.

81. HELIX LAVALLEANA, *d'Orb., Sagra, Cuba,* 161. t. 8. f. 16, 19. B.M.

82. HELIX MAURINIANA, *d'Orb., Sagra, Cuba,* 162. t. 8. f. 20, 23. B.M.

83. ACHATINA TRUNCATA, *d'Orb., Sagra, Cuba,* 163. t. 10. f. 13, 14. B.M.
Buccinum striatum, *Chemn.*
Bulla truncata, *Gmelin.*
Bulimus striatus, *Brug.*
Helix rosea, *Féruss.*
Achatina rosea et Achatina striata, *Desh.*

84. ACHATINA OLEACEA, *d'Orb., Sagra, Cuba,* 165. t. 10. f. 15, 16. B.M.
Helix oleacea, *Féruss.*

85. ACHATINA CUBANIANA, *d'Orb., Sagra, Cuba,* 166. t. 10. f. 17, 19. B.M.

86. ACHATINA ORYSACEA, *d'Orb., Sagra, Cuba,* 167. t. 10. f. 20, 25. B.M.
Helix orysacea, *Rang.*

87. ACHATINA SUBULATOIDES, *d'Orb., Sagra, Cuba,* 168. t. 11. f. 1, 3. B.M.

88. ACHATINA OCTONA, *d'Orb., Sagra, Cuba,* 168. t. 11. f. 4, 6. B.M.

Helix octona, *Chemn.*
Bulimus octonus, *Brug.*

89. ACHATINA CONSOBRINA, *d'Orb., Sagra, Cuba,* 170. t. 11. f. 7, 9. B.M.

90. ACHATINA MICHAUDIANA, *d'Orb., Sagra, Cuba,* 170. t. 11. f. 10, 12. B.M.

91. ACHATINA PALUDINOIDES, *d'Orb., Sagra, Cuba,* 171. t. 11. f. 13, 15. B.M.

92. ACHATINA FASCIATA, *Swainson, Sagra, Cuba,* 172. t. 6. f. 1, 8. B.M.

Bulla virginea, *Linn.*
Buccinum fasciatum, *Müller.*
Bulla fasciata, *Chemn.*
Bulimus vexillum, *Brug.*
Achatina vexillum, *Lamk.*
Achatina crenata, A. pallida et A. fasciata, *Swains.*

93. BULIMUS ZEBRA, *d'Orb., Sagra, Cuba,* 174. t. 7. f. 9, 14.

Zebra Mulleri, *Chemn.*
Bulimus undulatus, *Brug.*
Bulimus zigzag, *Lamk.*
Bulimus princeps, *Brod.*

94. BULIMUS ACUTICOSTATUS, *d'Orb., Sagra, Cuba,* 175. t. 11. f. 15, 18. B.M.

95. BULIMUS STRIATICOSTATUS, *d'Orb., Sagra, Cuba,* 176. t. 11. f. 19, 21. B.M.

96. BULIMUS OCTONOIDES, *d'Orb., Sagra, Cuba,* 177. t. 11. f. 23, 24. B.M.

97. PUPA DECUMANA, *Férussac, Sagra, Cuba,* 178. t. 11. f. 25, 26. B.M.

Helix decumana, *Féruss.*
Pupa mumia, *Sow.*

98. PUPA CHRYSALIS, *Férussac, Sagra, Cuba,* 179. t. 12. f. 1, 5. B.M.

Helix chrysalis, *Féruss.*

99. PUPA PETITIANA, *d'Orb., Sagra, Cuba,* 180. t. 12. f. 6, 8.

100. PUPA PARRAIANA, *d'Orb., Sagra, Cuba,* 181. t. 12. f. 9, 11.

101. PUPA BREVIS, *d'Orb., Sagra, Cuba,* 182. t. 12. f. 12, 14. B.M.

102. PUPA OVIEDOIANA, *d'Orb., Sagra, Cuba,* 182. t. 12. f. 15, 17. B.M.

103. PUPA LAVALLEANA, *d'Orb., Sagra, Cuba,* 183. t. 12. f. 18, 20. B.M.

104. PUPA AUBERIANA, *d'Orb., Sagra, Cuba,* 184. t. 12. f. 21, 23. B.M.

105. PUPA POËYANA, *d'Orb., Sagra, Cuba,* 185. t. 12. f. 24, 26. B.M.

Fam. 3. AURICULIDÆ.

106. AURICULA OVULA, *Féruss., Sagra, Cuba,* 186. t. 13. f. 1, 3. B.M.

Bulimus ovulus, *Brug.*
Voluta pusilla, *Gmelin.*
Auricula nitens, *Lamk.*

107. AURICULA CONIFORMIS, *Féruss., Sagra, Cuba,* 187. t. 13. f. 4, 7. B.M.

Voluta minuta, *Gmelin.*
Bulimus coniformis, *Brug.*

108. AURICULA OLIVA, *d'Orb., Sagra, Cuba,* 189. t. 12. f. 8, 10. B.M.

Fam. 4. LYMNEIDÆ.

109. PHYSA SOWERBYANA, *d'Orb., Sagra, Cuba,* 190. t. 13. f. 11, 13. B.M.

Lymnea rivalis, *Sow.*
Physa peruviana, *Gray* (?).
Physa rivalis, *d'Orb.*

110. PHYSA ACUTA, *Drap., Sagra, Cuba,* 191. B.M.

111. PHYSA STRIATA, *d'Orb., Sagra, Cuba,* 192. t. 13. f. 14, 16. B.M.

112. PLANORBIS CARIBÆUS, *d'Orb., Sagra, Cuba,* 193. t. 13. f. 17, 19. B.M.

113. PLANORBIS TERVERIANUS, *d'Orb., Sagra, Cuba,* 194. t. 13. f. 20, 23. B.M.

114. PLANORBIS LANIERIANUS, *d'Orb., Sagra, Cuba,* 195. t. 14. f. 1, 4. B.M.

115. PLANORBIS CULTRATUS, *d'Orb., Sagra, Cuba,* 196. t. 14. f. 5, 8. B.M.

Order V. PECTINIBRANCHIA.

Suborder I. MONOICA.

Fam. 1. LITTORINIDÆ.

116. LITTORINA MURICATA, *d'Orb., Sagra, Cuba,* 203. t. 14. f. 9, 10. B.M.

Turbo neritoideus muricatus, *Linn.*
Turbo muricatus, *Born.*

117. LITTORINA NODULOSA, *d'Orb., Sagra, Cuba,* 205. t. 14. f. 11, 14. B.M.

Trochus nodulosus, *Gmelin.*

118. LITTORINA TUBERCULATA, *d'Orb., Sagra, Cuba,* 206. t. 14. f. 15, 19. B.M.

Turbo tuberculatus, *Gray in Wood.*

119. LITTORINA DILATATA, *d'Orb., Sagra, Cuba,* 207. t. 14. f. 20, 23. B.M.

120. LITTORINA LINEATA, *d'Orb., Sagra, Cuba,* 208. t. 14. f. 24, 27. B.M.

Trochus zigzag, *Chemn.*
Phasianella lineata, *Lamk.*

121. LITTORINA CARINATA, *Sagra, Cuba,* 209. t. 15. f. 1, 4. B.M.

122. LITTORINA ZIGZAG, *d'Orb., Sagra, Cuba,* 210. t. 15. f. 5, 8. B.M.

Trochus zigzag, *Chemn.*

123. LITTORINA TIGRINA, *d'Orb., Sagra, Cuba,* 211. t. 15. f. 9, 11. B.M.

124. LITTORINA UNDULATA, *d'Orb., Sagra, Cuba,* 212. t. 15. f. 12, 14.

125. LITTORINA SCABRA, *d'Orb., Sagra, Cuba,* 212. t. 15. f. 15, 17. B.M.

Helix scabra, *Linn.*

126. LITTORINA COLUMELLARIS, *d'Orb., Sagra, Cuba,* 213. t. 15. f. 18, 20. B.M.

127. LITTORINA NATICOIDES, *d'Orb., Sagra, Cuba,* 214. t. 15. f. 21, 23. B.M.

Fam. 2. PYRAMIDELLIDÆ.

128. EULIMA BIFASCIATA, *d'Orb., Sagra, Cuba,* 216. t. 16. f. 1, 3. B.M.

129. EULIMA SUBCARINATA, *d'Orb., Sagra, Cuba,* 217. t. 16. f. 4, 6. B.M.

130. EULIMA INCERTA, *d'Orb., Sagra, Cuba,* 218. t. 16. f. 7, 9. B.M.

131. CHEMNITZIA TURRIS, *d'Orb., Sagra, Cuba,* 219. t. 16. f. 10, 13. B.M.

132. CHEMNITZIA PULCHELLA, *d'Orb., Sagra, Cuba,* 220. t. 16. f. 14, 17. B.M.

133. CHEMNITZIA ORNATA, *d'Orb., Sagra, Cuba,* 221. t. 16. f. 18, 21. B.M.

134. CHEMNITZIA MODESTA, *d'Orb., Sagra, Cuba,* 222. t. 16. f. 22, 24. B.M.

135. CHEMNITZIA ELEGANS, *d'Orb., Sagra, Cuba,* 223. t. 16. f. 25, 27. B.M.

136. CHEMNITZIA SIMPLEX, *d'Orb., Sagra, Cuba,* 224. t. 16. f. 28, 31. B.M.

137. CHEMNITZIA PUPOIDES, *d'Orb., Sagra, Cuba,* 224. t. 16. f. 32, 36. B.M.

138. CHEMNITZIA CANCELLATA, *d'Orb., Sagra, Cuba,* 225. t. 17. f. 1, 3. B.M.

139. CHEMNITZIA DUBIA, *d'Orb., Sagra, Cuba,* 226. t. 17. f. 4, 6. B.M.

140. CHEMNITZIA LÆVIGATA, *d'Orb., Sagra, Cuba,* 227. t. 17. f. 7, 9. B.M.

141. PYRAMIDELLA DOLABRATA, *Lamk., Sagra, Cuba,* 228. B.M.

Trochus dolabratus, *Linn.*
Helix dolabratus et Helix terebella, *Müller.*
Bulimus terebellus et Bulimus dolabratus, *Brug.*

142. TORNATELLA PUNCTATA, *d'Orb., Sagra, Cuba,* 230. t. 17. f. 10, 12. B.M.

Fam. 3. SIPHONARIDÆ.

143. SIPHONARIA PICTA, *d'Orb., Sagra, Cuba,* 231.

144. SIPHONARIA LINEOLATA, *d'Orb., Sagra, Cuba,* 232. t. 17. f. 13, 15. B.M.

Fam. 4. VERMETIDÆ.

145. VERMETUS LUMBRICALIS, *Lamk., Sagra, Cuba,* 234. B.M.

Serpula lumbricalis, *Linn.*

146. VERMETUS IRREGULARIS, *d'Orb., Sagra, Cuba,* 235. t. 17. f. 16, 18. B.M.

147. VERMETUS CORRODENS, *d'Orb., Sagra, Cuba,* 235. t. 18. f. 1, 3.

Suborder II. Dioica.

Fam. 5. CYCLOSTOMIDÆ.

148. Odontostoma depressa, *d'Orb., Sagra, Cuba,* t. 18. f. 4, 7. B.M.

149. Odontostoma globulosa, *d'Orb., Sagra, Cuba,* t. 18. f. 8, 11. B.M.

150. Helicina Sagraiana, *d'Orb., Sagra, Cuba,* 240. t. 18. f. 12, 14. B.M.

151. Helicina virginea, *Lea, Sagra, Cuba,* 241. B.M.

152. Helicina variegata, *d'Orb., Sagra, Cuba,* 242. t. 19. f. 1, 4. B.M.

153. Helicina crassa, *d'Orb., Sagra, Cuba,* 243. t. 19. f. 5, 6. B.M.

154. Helicina submarginata, *Gray, Sagra, Cuba,* 244. t. 19. f. 7, 8. B.M.

155. Helicina marmorata, *d'Orb., Sagra, Cuba,* 244. t. 19. f. 9, 12. B.M.

156. Helicina Lanieriana, *d'Orb., Sagra, Cuba,* 245. t. 19. f. 13, 14.

157. Helicina zephirina, *Duclos, Sagra, Cuba,* 246. t. 19. f. 15, 16.

158. Helicina Petitiana, *d'Orb., Sagra, Cuba,* 247. t. 20. f. 1–8.

159. Helicina Sloanii, *d'Orb., Sagra, Cuba,* 248. t. 20. f. 4, 6.

160. Helicina conica, *d'Orb., Sagra, Cuba,* 249. t. 20. f. 9, 10. B.M.

161. Helicina trochulina, *d'Orb., Sagra, Cuba,* 249. t. 20. f. 10, 12. B.M.

162. HELICINA ELEGANS, *d'Orb., Sagra, Cuba,* 250. t. 20. f. 13, 15.

163. HELICINA ELONGATA, *d'Orb., Sagra, Cuba,* 251. t. 20. f. 16, 18. B.M.

164. HELICINA ROTUNDA, *d'Orb., Sagra, Cuba,* 252. t. 21. f. 1, 3. B.M.

165. HELICINA DENTIGERA, *d'Orb., Sagra, Cuba,* 252. t. 21. f. 4, 6. B.M.

166. HELICINA MINIMA, *d'Orb., Sagra, Cuba,* 253. t. 21. f. 7, 9. B.M.

167. HELICINA GLOBULOSA, *d'Orb., Sagra, Cuba,* 254. t. 21. f. 10, 11. B.M.

168. CYCLOSTOMA LATILABRIS, *d'Orb., Sagra, Cuba,* 255. t. 21. f. 12. B.M.

169. CYCLOSTOMA VENTRICOSA, *d'Orb., Sagra, Cuba,* 256. t. 21. f. 3. B.M.

170. CYCLOSTOMA TORTA, *Gray, Sagra, Cuba,* 257. B.M.
Cyclostoma Idolium, *Féruss.*

171. CYCLOSTOMA AURICULATA, *d'Orb., Sagra, Cuba,* 257. t. 22. f. 1, 2. B.M.

172. CYCLOSTOMA BILABIATA. *d'Orb., Sagra, Cuba,* 258. t. 22. f. 3, 5. B.M.

173. CYCLOSTOMA PUDICA, *d'Orb., Sagra, Cuba,* 259. t. 22. f. 6, 8. B.M.

174. CYCLOSTOMA PRETREI, *d'Orb., Sagra, Cuba,* 260. t. 22. f. 9, 11. B.M.

175. CYCLOSTOMA AUBERIANA, *d'Orb., Sagra, Cuba,* 260. t. 22. f. 12, 14.

176. CYCLOSTOMA CANDEANA, *d'Orb., Sagra, Cuba,* 261. t. 22. f. 15, 17. B.M.

177. CYCLOSTOMA DELATREANA, *d'Orb., Sagra, Cuba,* 262. t. 22. f. 18, 20.

178. CYCLOSTOMA SAGRA, *d'Orb., Sagra, Cuba,* 263. t. 22. f. 21, 23. B.M.

179. CYCLOSTOMA POËYANA, *d'Orb., Sagra, Cuba,* 264. t. 22. f. 24, 27.

Fam. 6. AMPULLARIDÆ.

180. AMPULLARIA FASCIATA, *Lamk., Sagra, Cuba,* ii. 2. B.M.
Helix ampullaria, *Born.*

Fam. 7. PALUDINIDÆ.

181. TRUNCATELLA SUBCYLINDRICA, *d'Orb.* B.M.
Helix subcylindrica, *Mont.*
Cyclostoma truncatulum, *Drap.*
Truncatella lævigata et Truncatella costulata, *Risso.*
Paludina truncata et Paludina Desnoyersii, *Payr.*
Truncatella truncatula, *Lowe.*
Rissoa truncata, *Philippi.*

182. PALUDINA BERMONDIANA, *d'Orb., Sagra, Cuba,* ii. 7. t. 10. f. 5. B.M.

183. PALUDESTRINA AUBERIANA, *d'Orb., Sagra, Cuba,* ii. 8. t. 10. f. 6, 7. B.M.

184. PALUDESTRINA AFFINIS, *d'Orb., Sagra, Cuba,* ii. 8. t. 10. f. 8. B.M.

185. PALUDESTRINA CANDEANA, *d'Orb., Sagra, Cuba,* ii. 9. t. 10. f. 13, 14. B.M.

186. MELANIA BREVIS, *d'Orb., Sagra, Cuba,* ii. 10. t. 10. f. 15. B.M.

187. MELANIA CUBANIANA, *d'Orb., Sagra, Cuba,* ii. 11. t. 10. f. 16. B.M.

188. MELANIA CONICA, *d'Orb., Sagra, Cuba,* ii. 12. t. 10. f. 20. B.M.

189. TURRITELLA IMBRICATA, *Lamk., Sagra, Cuba,* ii. 13. B.M.

Turbo imbricatus, *Linn.*

190. TURRITELLA CARIBÆA, *d'Orb., Sagra, Cuba,* ii. 14. t. 10. f. 21. B.M.

191. SCALARIA PSEUDOSCALARIS, *Risso, Sagra, Cuba,* ii. 15. B.M.

Turbo pseudoscalaris, *Brocchi.*
Scalaria lamellosa, *Lamk.*

192. SCALARIA HOTESSIERIANA, *d'Orb., Sagra, Cuba,* ii. 16. t. 10. f. 22, 23. B.M.

193. SCALARIA ALBIDA, *d'Orb., Sagra, Cuba,* ii. 17. t. 10. f. 24, 25. B.M.

194. SCALARIA FOLIACEI-COSTA, *d'Orb., Sagra, Cuba,* ii. 17. t. 10. f. 26, 28. B.M.

195. SCALARIA ECHINATI-COSTA, *d'Orb., Sagra, Cuba,* ii. 18. t. 11. f. 4, 6. B.M.

196. SCALARIA UNCINATI-COSTA, *d'Orb., Sagra, Cuba,* ii. 19. t. 11. f. 25, 27. B.M.

197. SCALARIA CANDEANA, *d'Orb., Sagra, Cuba,* ii. 20. t. 11. f. 28, 30. B.M.

198. RISSOINA CARIBÆA, *d'Orb., Sagra, Cuba,* ii. 21. t. 11. f. 31, 33. B.M.

199. RISSOINA AUBERIANA, *d'Orb., Sagra, Cuba,* ii. 22. t. 11. f. 34, 36. B.M.

200. RISSOINA GRADATA, *d'Orb., Sagra, Cuba,* ii. 23. t. 11. f. 37, 39. B.M.

201. RISSOINA CATESBYANA, *d'Orb., Sagra, Cuba,* ii. 24. t. 12. f. 1, 3. B.M.

202. RISSOINA SAGRAIANA, *d'Orb., Sagra, Cuba,* ii. 25. t. 12. f. 4, 5. B.M.

203. RISSOINA ELEGANTISSIMA, *d'Orb., Sagra, Cuba,* ii. 26. t. 12. f. 27, 29. B.M.

204. RISSOINA STRIATO-COSTATA, *d'Orb., Sagra, Cuba,* ii. 27. t. 12. f. 30, 32. B.M.

205. RISSOINA BROWNIANA, *d'Orb., Sagra, Cuba,* ii. 28. t. 12. f. 33, 35. B.M.

206. RISSOINA SLOANIANA, *d'Orb., Sagra, Cuba,* ii. 28. t. 12. f. 36, 38.

Fam: 8. NATICIDÆ.

207. NATICA CANRENA, *Lamk., Sagra, Cuba,* ii. 30. B.M.
Nerita canrena, *Linn.*
Nerita ala papilionis, *Chemn.*

208. NATICA UBERINA, *d'Orb., Sagra, Cuba,* ii. 31. t. 17. f. 19. B.M.

209. NATICA NITIDA, *Donov., Sagra, Cuba,* ii. 32. B.M.

210. NATICA MAMILLARIS, *Lamk., Sagra, Cuba,* ii. 32. B.M.
Mamma Veneris fuscata, *Chemn.*
Nerita mamilla, *Gmelin.*
Nerita mamillaris, *Schræt.*

211. NATICA SULCATA, *d'Orb., Sagra, Cuba,* ii. 32. B.M.
Nerita sulcata, *Born.*
Nerita rugosa, *Chemn.*
Nerita cancellata, *Gmelin.*

212. NATICA SAGRAIANA, *d'Orb., Sagra, Cuba,* ii. 34. t. 17. f. 20, 22. B.M.

213. NATICA LACERNULA, *d'Orb., Sagra, Cuba,* ii. 35. t. 17. f. 23, 25. B.M.

214. SIGARETUS HALIOTIDEUS, *Lamk., Sagra, Cuba,* ii. 37. B.M.
Auris marina, *Gualt.*
Helix haliotidea, *Linn.*
Cryptostoma Leachi, *Blainv.*
Sigaretus Leachii, *Sow.*

215. SIGARETUS ZONATUS, *d'Orb., Sagra, Cuba,* ii. 38. B.M.
Helix haliotidea, *Gmelin.*
Sigaretus Haliotideus, *Lamk.*

216. NARICA SULCATA, *d'Orb., Sagra, Cuba,* ii. 39. t. 17. f. 26, 28. B.M.

217. NARICA STRIATA, *d'Orb., Sagra, Cuba,* ii. 40. t. 17. f. 29, 31. B.M.

218. NARICA LAMELLOSA, *d'Orb., Sagra, Cuba,* ii. 41. t. 17. f. 32, 34. B.M.

Fam. 9. NERITIDÆ.

219. NERITINA MELEAGRIS, *Lamk., Sagra, Cuba,* ii. 43. B.M.

220. NERITINA VIRGINEA, *Lamk., Sagra, Cuba,* ii. 44. B.M.
Nerita virginea, *Linn.*

221. NERITINA PUPA, *Sow., Sagra, Cuba,* ii. 45. B.M.
Nerita pupa, *Gmelin.*

222. NERITINA VIRIDIS, *Lamk., Sagra, Cuba,* ii. 46. B.M.
Nerita viridis, *Linn.*

223. NERITINA PUNCTULATA, *Lamk., Sagra, Cuba,* ii. 47. B.M.

224. NERITINA TRISTIS, *d'Orb., Sagra, Cuba,* ii. 47. t. 17. f. 35. B.M.

225. NERITINA MICROSTOMA, *d'Orb., Sagra, Cuba,* ii. 48. t. 17. f. 36. B.M.

226. NERITA PELORONTA, *Linn., Sagra, Cuba,* ii. 49. B.M.

227. NERITA STRIATA, *Chemn., Sagra, Cuba,* ii. 50. B.M.
Nerita versicolor, *Gmelin.*

228. NERITA TESSELLATA, *Gmelin, Sagra, Cuba,* ii. 51. B.M.

229. NERITA ANTILLARUM, *Gmelin, Sagra, Cuba,* ii. 52. B.M.
Nerita nigerrima, var., *Chemn.*

Fam. 10. TROCHIDÆ.

230. TROCHUS PICA, *d'Orb., Sagra, Cuba,* ii. 54. B.M.
Turbo pica, *Linn.*
Turbo nodulosus, *Born.*

231. TROCHUS CONCAVUS, *Gmelin, Sagra, Cuba,* ii. 55.

232. TROCHUS EXCAVATUS, *Lamk., Sagra, Cuba,* ii. 56. B.M.

233. TROCHUS UNIDENS, *d'Orb., Sagra, Cuba,* ii. 57. B.M.
Trochus modulus, *Linn.*
Trochus lenticularis et T. unidens, *Chemn.*
Trochus tectum, var., *Gmelin.*
Monodonta Carchedonius, *Lamk.*
Trochus perlatus, *Gray, Wood.*

234. TROCHUS CARNEOLUS, *Lamk., Sagra, Cuba,* ii. 58. B.M.

235. TROCHUS HORTESSIERIANUS, *d'Orb., Sagra, Cuba,* ii. 59. t. 18. f. 15, 17. B.M.

236. TROCHUS CANALICULATUS, *d'Orb., Sagra, Cuba,* ii. 60. t. 18. f. 18, 19. B.M.

237. ROTELLA SEMISTRIATA, *d'Orb., Sagra, Cuba,* ii. 61. t. 18. f. 20, 22. B.M.

238. ROTELLA DIAPHANA, *d'Orb., Sagra, Cuba,* ii. 62. t. 18. f. 23, 25. B.M.

239. ROTELLA CARINATA, *d'Orb., Sagra, Cuba,* ii. 62. t. 18. f. 26, 28. B.M.

240. ROTELLA STRIATA, *d'Orb., Sagra, Cuba,* ii. 63. t. 18. f. 29, 31. B.M.

241. ROTELLA ANOMALA, *d'Orb., Sagra, Cuba,* 64. t. 18. f. 32, 34. B.M.

242. SOLARIUM GRANULATUM, *Lamk., Sagra, Cuba,* ii. 65. B.M.
Trochus perspectivus, *Chemn.*

243. SOLARIUM BISULCATUM, *d'Orb., Sagra, Cuba,* ii. 66. t. 19. f. 17, 20. B.M.

244. SOLARIUM DELPHINULOIDES, *d'Orb., Sagra, Cuba,* ii. 67. t. 19. f. 21, 24.

245. SOLARIUM INORNATUM, *d'Orb., Sagra, Cuba,* ii. 67. t. 19. f. 25, 27.

246. HELIACUS HEBERTI, *d'Orb., Sagra, Cuba,* ii. 68. B.

247. DELPHINULA TUBERCULOSA, *d'Orb., Sagra, Cuba,* ii. 69. t. 19. f. 28, 30. B.M.

248. PHORUS CONCHYLIOPHORUS, *Montf., Sagra, Cuba,* ii. 70. t. 19. f. 31. B.M.
Trochus conchyliophorus, *Born.*
Trochus lithophorus, *Chemn.*

249. TURBO LONGISPINA, *d'Orb., Sagra, Cuba,* ii. 72. B.M.

250. TURBO INERMIS, *d'Orb., Sagra, Cuba,* ii. 73. B.M.
Calcar magus, *Chemn.*
Trochus solaris, *Chemn.*
Trochus inermis, *Gmel.*
Trochus calcar, *Gmel.*

251. TURBO BREVISPINA, *d'Orb., Sagra, Cuba,* ii. 78. B.M.
Trochus brevispina, *Lamk.*

252. TURBO CŒLATUS, *d'Orb., Sagra, Cuba,* ii. 74. B.M.
Trochus cœlatus, *Chemn.*

253. TURBO TUBER, *d'Orb., Sagra, Cuba,* ii. 75. B.M.
Trochus tuber, *Born.*
Trochus tuberculatus, *Chemn.*
Trochus viridis, *Chemn.*

254. TURBO CASTANEUS, *Gmelin, Sagra, Cuba,* ii. 76. B.M.
Turbo hippocastanum, *Gmel.*

255. PHASIANELLA UMBILICATA, *d'Orb., Sagra, Cuba,* ii. 77. t. 19. f. 32, 34. B.M.

256. PHASIANELLA ZEBRINA, *d'Orb.*, *Sagra, Cuba,* ii. 78. t. 19. f. 35, 37. B.M.

257. PHASIANELLA BREVIS, *d'Orb.*, *Sagra, Cuba,* ii. 79. t. 20. f. 19, 21. B.M.

Fam. 11. IANTHINIDÆ.

258. IANTHINA FRAGILIS, *Lamk.*, *Sagra, Cuba,* ii. 80.
Helix Ianthina, *Linn.*
Trochus Ianthinus, *Chemn.*
Ianthina penicephala, *Peron.*
Ianthina communis, *Lamk.*
Ianthina bicolor, *Costa.*

259. IANTHINA PROLONGATA, *Blainv.*, *Sagra, Cuba,* ii. 83. B.M.
Ianthina globosa, *Swains.*
Ianthina communis, *Costa.*
Ianthina nitens, *Menke.*

260. IANTHINA EXIGUA, *Lamk.*, *Sagra, Cuba,* ii. 84.

261. IANTHINA UMBILICATA, *d'Orb.*, *Sagra, Cuba,* ii. 85. t. 20. f. 22, 23.

Fam. 12. CYPREADÆ.

262. OVULA GIBBOSA, *Lamk.*, *Sagra, Cuba,* ii. 86. B.M.
Bulla gibbosa, *Linn.*
Bulla brasiliensis, *Martini.*

263. OVULA ACICULARIS, *Lamk.*, *Sagra, Cuba,* ii. 87. B.M.
Bulla secale, *Wood.*

264. CYPRÆA EXANTHEMA, *Linn.*, *Sagra, Cuba,* ii. 88. B.M.

265. CYPRÆA MUS, *Linn.*, *Sagra, Cuba,* ii. 89. B.M.

266. CYPRÆA SPURCA, *Linn.*, *Sagra, Cuba,* ii. 90. B.M.
Cypræa acicularis, *Gmelin.*
Cypræa flaveola, *Lamk.*

267. CYPRÆA CINEREA, *Gmelin, Sagra, Cuba,* ii. 91. B.M.
Cypræa sordida, *Lamk.*

268. CYPRÆA MONETA, *Linn., Sagra, Cuba,* ii. 92. B.M.

269. CYPRÆA PEDICULUS, *Linn., Sagra, Cuba,* ii. 93. B.M.
Cypræa sulcata, *Wood.*

270. CYPRÆA QUADRIPUNCTATA, (*Gray*), *Sagra, Cuba,* ii. 94. B.M.

271. CYPRÆA NIVEA, (*Gray*), *Sagra, Cuba,* ii. 94. B.M.

272. MARGINELLA LONGIVARICOSA, *Lamk., Sagra, Cuba,* ii. 95. B.M.

273. MARGINELLA CÆRULESCENS, *Lamk., Sagra, Cuba,* ii. 96. B.M.

274. MARGINELLA MARGINATA, *d'Orb., Sagra, Cuba,* ii. 96.
Voluta marginata, *Born.*
Marginella bivaricosa, *Lamk.*

275. MARGINELLA INTERRUPTA, *Lamk., Sagra, Cuba,* ii. 97. B.M.

276. MARGINELLA CARIBÆA, *d'Orb., Sagra, Cuba,* ii. 97. t. 20. f. 24, 26. B.M.

277. MARGINELLA AVENA, *Kiener, Sagra, Cuba,* ii. 98. B.M.

278. MARGINELLA ALBOLINEATA, *d'Orb., Sagra, Cuba,* ii. 99. t. 20. f. 27, 29. B.M.

279. MARGINELLA SUBTRIPLICATA, *d'Orb., Sagra, Cuba,* ii. 99. t. 20. f. 30, 32. B.M.

280. MARGINELLA PALLIDA, *d'Orb., Sagra, Cuba,* ii. 100. B.M.
Volvaria pallida, *Lamk.*

281. MARGINELLA OVULIFORMIS, *d'Orb., Sagra, Cuba,* ii. 101. t. 20. f. 33, 35. B.M.

282. MARGINELLA LAVALLEEANA, *d'Orb.*, *Sagra*, *Cuba*, 101. t. 20. f. 36, 38. B.M.

283. MARGINELLA SULCATA, *d'Orb.*, *Sagra*, *Cuba*, ii. 102. t. 21. f. 14, 16. B.M.

284. RINGICULA SEMISTRIATA, *d'Orb.*, *Sagra*, *Cuba*, ii. 103. t. 21. f. 17, 19.

Fam. 13. OLIVIDÆ.

285. OLIVINA CONOIDALIS, *d'Orb.*, *Sagra*, *Cuba*, ii. 105. B.M.
Oliva conoidalis, *Lamk.*

286. OLIVINA NIVEA, *d'Orb.*, *Sagra*, *Cuba*, ii. 106. B.M.
Voluta nivea, *Gmelin.*
Oliva eburnea, *Lamk.*

287. OLIVINA MICA, *d'Orb.*, *Sagra*, *Cuba*, ii. 107.
Oliva mica, *Duclos.*

288. OLIVINA MYRIADINA, *d'Orb.*, *Sagra*, *Cuba*, ii. 108. B.M.
Oliva myriadina, *Duclos.*

289. OLIVINA MILIOLA, *d'Orb.*, *Sagra*, *Cuba*, ii. 108. t. 21. f. 20, 22. B.M.

290. OLIVA RETICULARIS, *Lamk.*, *Sagra*, *Cuba*, ii. 109. B.M.

291. OLIVA SCRIPTA, *Lamk.*, *Sagra*, *Cuba*, ii. 110. B.M.

292. OLIVANCILLARIA LEUCOSTOMA, *d'Orb.*, *Sagra*, *Cuba*, ii. 111. B.M.
Oliva leucostoma, *Duclos.*

293. ANCILLARIA GLABRATA, *d'Orb.*, *Sagra*, *Cuba*, ii. 112. B.M.
Buccinum glabratum, *Linn.*
Nassa umbilicata, *Chemn.*
Eburna glabrata, *Lamk.*

294. CONUS DAUCUS, *Brug., Sagra, Cuba,* ii. 114. B.M.
Conus arausiacus, *Chemn.*

295. CONUS NEBULOSUS, *Soland., Sagra, Cuba,* ii. 115. B.M.

296. CONUS MUS, *Brug., Sagra, Cuba,* ii. 116. B.M.

297. CONUS PROTEUS, *Brug., Sagra, Cuba,* ii. 117. B.M.

Fam. 14. STROMBIDÆ.

298. STROMBUS GIGAS, *Linn., Sagra, Cuba,* ii. 118. B.M.

299. STROMBUS ACCIPITRINUS, *Lamk., Sagra, Cuba,* ii. 119.
Strombus costatus, *Gmelin.*

300. STROMBUS GALLUS, *Linn., Sagra, Cuba,* ii. 119. B.M.

301. STROMBUS BITUBERCULATUS, *Lamk., Sagra, Cuba,* ii. 120. B.M.

302. STROMBUS PUGILIS, *Linn., Sagra, Cuba,* ii. 121. B.M.

303. STROMBUS LENTIGINOSUS, *Linn., Sagra, Cuba,* ii. 122. B.M.

Fam. 15. VOLUTIDÆ.

304. VOLUTA VESPERTILIO, *Linn., Sagra, Cuba,* ii. 123. B.M.

305. VOLUTA MUSICA, *Linn., Sagra, Cuba,* ii. 124. B.M.

306. MITRA STRIATULA, *Lamk., Sagra, Cuba,* ii. 126. B.M.

307. MITRA NODULOSA, *d'Orb., Sagra, Cuba,* ii. 126. B.M.
Voluta nodulosa, *Gmelin.*
Mitra granulosa, *Lamk.*

308. CANCELLARIA RETICULATA, *Lamk., Sagra, Cuba,* ii. 128. B.M.
Voluta reticulata, *Linn.*

309. CANCELLARIA CANDEI, *d'Orb., Sagra, Cuba,* ii. 129. t. 21. f. 23, 25. B.M.

Fam. 16. BUCCINIDÆ.

310. ONISCIA ONISCUS, *Sow.*, *Sagra*, *Cuba*, ii. 130. B.M.
Strombus oniscus, *Linn.*
Cassidea oniscus, *Brug.*
Cassidaria oniscus, *Lamk.*

311. COLUMBELLA MERCATORIA, *Lamk.*, *Sagra*, *Cuba*, ii. 132. B.M.
Voluta mercatoria, *Linn.*

312. COLUMBELLA BARBADENSIS, *d'Orb.*, *Sagra*, *Cuba*, ii. 133. B.M.
Columbella reticularis, *Lamk.*

313. COLUMBELLA OVULATA, *Lamk.*, *Sagra*, *Cuba*, ii. 133. B.M.

314. COLUMBELLA NITIDA, *Lamk.*, *Sagra*, *Cuba*, ii. 134. B.M.
Columbella nitidula, *Sow.*

315. COLUMBELLA OCELLATA, *d'Orb.*, *Sagra*, *Cuba*, ii. 134. ?B.M.
Columbella concinna, *Sow.*

316. COLUMBELLA CRIBRARIA, *d'Orb.*, *Sagra*, *Cuba*, ii. 134. B.M.
Buccinum cribrarium, *Lamk.*

317. COLUMBELLA DUCLOSIANA, *d'Orb.*, *Sagra*, *Cuba*, ii. 136. t. 21. f. 31–33. B.M.

318. COLUMBELLA FUSIFORMIS, *d'Orb.*, *Sagra*, *Cuba*, ii. 136. t. 21. f. 25–27. B.M.

319. COLUMBELLA SAGRAIANA, *d'Orb.*, *Sagra*, *Cuba*, ii. 137. t. 21. f. 28–30. B.M.

320. COLUMBELLA ARGUS, *d'Orb.*, *Sagra*, *Cuba*, ii. 138. t. 21. f. 34–37. B.M.
Columbella ocellata, *Sagra.*

321. COLUMBELLA HOTESSIERI, *d'Orb.*, *Sagra*, *Cuba*, ii. t. 21. f. 37–39. B.M.

322. NASSA POLYGONA, *d'Orb., Sagra, Cuba,* ii. 140. B.M.
Buccinum polygonum, *Lamk.*

323. NASSA ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 141. t. 23. f. 1-3. B.M.

324. NASSA HOTESSIERI, *d'Orb., Sagra, Cuba,* ii. 142. t. 21. f. 40-42. B.M.

325. NASSA CANDEI, *d'Orb., Sagra, Cuba,* ii. 142. t. 23. f. 4-6. B.M.

326. PURPURA PATULA, *Lamk., Sagra, Cuba,* ii. 144.
Buccinum patulum, *Linn.*

327. PURPURA HÆMASTOMA, *Lamk., Sagra, Cuba,* ii. 144. B.M.
Buccinum hæmastoma, *Gmelin.*

328. PURPURA SUBDELTOIDEA, *Blainv., Sagra, Cuba,* ii. 145. B.M.

329. PURPURA UNDATA, *Lamk., Sagra, Cuba,* ii. 145. B.M.

330. PURPURA ACCINCTA, *d'Orb., Sagra, Cuba,* ii. 146. B.M.
Murex accinctus, *Born.*
Buccinum plumatum, *Gmelin.*
Fusus articulatus, *Lamk.*

331. PURPURA VEXILLUM, *Lamk., Sagra, Cuba,* ii. 147. B.M.
Strombus vexillum, *Chemn.*
Cassidaria vexillum, *Kiener.*

332. PURPURA GALEA, *d'Orb., Sagra, Cuba,* ii. 147. B.M.
Murex galea, *Chemn.*
Pyrula abbreviata, *Lamk.*

333. LITIOPA MACULATA, *Rang, Sagra, Cuba,* ii. 149. B.M.
Litiopa melanostoma, *Rang.*
Litiopa bombix, *Kiener.*

334. SINUSIGERA CANCELLATA, *d'Orb., Sagra, Cuba,* ii. 150. t. 23. f. 7-9. B.M.

335. PLANAXIS NUCLEUS, *Deshayes, Sagra, Cuba*, ii. 151. B.M.
Buccinum nucleus, *Wood.*

336. TEREBRA CINEREA, *d'Orb., Sagra, Cuba*, ii. 152. B.M.
Buccinum cinereum, *Born.*

337. TEREBRA RUDIS, *Gray, Sagra, Cuba*, ii. 152. B.M.

338. CERITHIUM LITTERATUM, *Brug., Sagra, Cuba*, ii. 153. B.M.
Murex litteratum, *Born.*

339. CERITHIUM EBURNEUM, *Brug., Sagra, Cuba*, ii. 154. B.M.

340. CERITHIUM LIMA, *Brug., Sagra, Cuba*, ii. 154. B.M.

341. CERITHIUM TURRIS-THOMÆ, *d'Orb., Sagra, Cuba*, ii. 155. t. 33. f. 10–12. B.M.
Turbo turris-Thomæ, *Chemn.*

342. CERITHIUM COLUMELLARE, *d'Orb., Sagra, Cuba*, ii. 155. t. 23. f. 13–15. B.M.

343. CERITHIUM LAVALLEANUM, *d'Orb., Sagra, Cuba*, ii. 156. t. 23. f. 16. B.M.

344. CERITHIUM SAGRÆ, *d'Orb., Sagra, Cuba*, ii. 156. t. 23. f. 17–19. B.M.

345. CERITHIUM MUSCARUM, *Say, Sagra, Cuba*, ii. 157. B.M.

Fam. 17. MURICIDÆ.

346. MUREX ASPERRIMUS, *Lamk., Sagra, Cuba*, ii. 158. B.M.
Murex pomum, *Gmelin.*

347. MUREX BREVIFRONS, *Lamk., Sagra, Cuba*, ii. 159. B.M.

348. MUREX MESSORIUS, *Sow., Sagra, Cuba*, ii. 159. B.M.

349. MUREX ELEGANS, *Beck, Sagra, Cuba*, ii. 160. B.M.

350. TRITON FEMORALE, *Lamk., Sagra, Cuba*, ii. 160. B.M.
Murex femorale, *Linn.*

351. TRITON CHLOROSTOMA, *Lamk.*, *Sagra, Cuba*, ii. 161. B.M.

352. TRITON ANTILLARUM, *d'Orb.*, *Sagra, Cuba*, ii. 161. t. 23. f. 20. B.M.

353. TRITON CARIBÆUM, *d'Orb.*, *Sagra, Cuba*, ii. 162.

354. TRITON MARTINIANUM, *d'Orb.*, *Sagra, Cuba*, ii. 162. B.M.
Triton pileare, *Lamk.*

355. TRITON AMERICANUM, *d'Orb.*, *Sagra, Cuba*, ii. 163. t. 23. f. 22. B.M.
Triton pileare, *d'Orb.*, non *Lamk.*

356. RANELLA THOMÆ, *d'Orb.*, *Sagra, Cuba*, ii. 164. t. 23. f. 23, 24. B.M.

357. RANELLA CRASSA, *Reeve, Sagra, Cuba*, ii. 164. B.M.
Ranella granulata, *Lamk.*

358. RANELLA CUBANIANA, *d'Orb.*, *Sagra, Cuba*, ii. 165. t. 23. f. 24. B.M.

Fam. 18. FUSIDÆ.

359. FUSUS MORIO, *Brug.*, *Sagra, Cuba*, ii. 166. B.M.
Murex morio, *Linn.*
Fusus coronatus, *Lamk.*

360. PYRULA PERVERSA, *Lamk.*, *Sagra, Cuba*, ii. 167. B.M.
Murex perversus, *Linn.*

361. PYRULA MELONGENA, *Lamk.*, *Sagra, Cuba*, ii. 167. B.M.
Murex melongena, *Linn.*

362. FASCIOLARIA TULIPA, *Lamk.*, *Sagra, Cuba*, ii. 168. B.M.
Murex tulipa, *Linn.*

363. FASCIOLARIA GIGANTEA, *d'Orb.*, *Sagra, Cuba*, ii. 169. t. 23. f. 25. B.M.

364. PLEUROTOMA COSTATA, *Gray*, *Sagra, Cuba*, ii. 169.

365. PLEUROTOMA GUILDINGII, *Reeve, Sagra, Cuba*, ii. 170.

366. PLEUROTOMA NIGRESCENS, *Gray, Sagra, Cuba,* ii. 170. B.M.

367. PLEUROTOMA DORVILLÆ, *Gray, Sagra, Cuba,* ii. 171.

368. PLEUROTOMA PENTAGONALIS, *Gray, Sagra, Cuba,* ii. 171.

369. PLEUROTOMA ORNATA, *d'Orb., Sagra, Cuba,* ii. 171. t. 23. f. 26, 28. B.M.

370. PLEUROTOMA LUCTUOSA, *d'Orb., Sagra, Cuba,* ii. 172. t. 23. f. 29, 31. B.M.

371. PLEUROTOMA CARIBÆA, *d'Orb., Sagra, Cuba,* ii. 172. t. 22. f. 32, 34. B.M.

372. PLEUROTOMA ELATIOR, *d'Orb., Sagra, Cuba,* ii. 173. t. 23. f. 35, 37. B.M.

373. PLEUROTOMA ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 173. t. 24. f. 1, 3. B.M.

374. PLEUROTOMA AUBERIANA, *d'Orb., Sagra, Cuba,* ii. 174. t. 24. f. 4, 6. B.M.

375. PLEUROTOMA LAVALLEANA, *d'Orb., Sagra, Cuba,* ii. 174. t. 24. f. 7, 9. B.M.

376. PLEUROTOMA CANDEANA, *d'Orb., Sagra, Cuba,* ii. 175. t. 24. f. 10, 12. B.M.

377. PLEUROTOMA VESPUCIANA, *d'Orb., Sagra, Cuba,* ii. 175. t. 24. f. 13, 15. B.M.

378. PLEUROTOMA ALBOMACULATA, *d'Orb., Sagra, Cuba,* ii. 176. t. 24. f. 16, 18. B.M.

379. TURBINELLA PUGILLARIS, *Lamk., Sagra, Cuba,* ii. 177. B.M.

380. TURBINELLA NASSA, *d'Orb., Sagra, Cuba,* ii. 177. B.M.

Murex nassa, *Gmelin.*
Turbinella cingulifera, *Lamk.*

381. TURBINELLA INFUNDIBULUM, *Lamk.*, *Sagra*, *Cuba*, ii. 178. B.M.
Murex infundibulum, *Gmelin.*

382. TURBINELLA CAPITELLUM, *Lamk.*, *Sagra*, *Cuba*, ii. 178. B.M.
Voluta capitellum, *Gmelin.*

383. TURBINELLA POLYGONA, *Lamk.*, *Sagra*, *Cuba*, ii. 179. B.M.
Murex polygonus, *Gmelin.*

Fam. 19. CASSIDÆ.

384. CASSIS TUBEROSA, *Lamk.*, *Sagra*, *Cuba*, ii. 180.
Buccinum tuberosum, *Linn.*

385. CASSIS FLAMMEA, *Lamk.*, *Sagra*, *Cuba*, ii. 180. B.M.
Buccinum flammeum, *Linn.*

386. CASSIS TESTICULUS, *Lamk.*, *Sagra*, *Cuba*, ii. 181. B.M.
Buccinum testiculus, *Linn.*

387. CASSIS GRANULOSA, *Lamk.*, *Sagra*, *Cuba*, ii. 181. B.M.
Cassidea granulosa, *Brug.*

388. DOLIUM PERDIX, *Lamk.*, *Sagra*, *Cuba*, ii. 182. B.M.
Buccinum perdix, *Linn.*

Fam. 20. HALIOTIDÆ.

389. STOMATIA PICTA, *d'Orb.*, *Sagra*, *Cuba*, ii. 184. t. 24. f. 19, 21. B.M.

Fam. 21. CREPIDULIDÆ.

390. CAPULUS MITRULUS, *d'Orb.*, *Sagra*, *Cuba*, ii. 186. B.M.
Lepas alba, *Martini.*
Patella mitrula, *Gmelin.*
Hipponyx mitrula, *Defr.*
Pileopsis mitrula, *Lamk.*

391. CAPULUS INTORTUS, *d'Orb., Sagra, Cuba,* ii. 186. t. 24. f. 22, 23. B.M.

Pileopsis intorta, *Lamk.*
Patella militaris, *Wood.*

392. CAPULUS SUBRUFUS, *d'Orb., Sagra, Cuba,* ii. 186. t. 24. f. 24, 25. B.M.

Patella subrufa, *Lister.*
Pileopsis subrufa, *Lamk.*

393. CALYPTRÆA EQUESTRIS, *Lamk., Sagra, Cuba,* ii. 189. B.M.

Patella equestris, *Linn.*

394. INFUNDIBULUM CANDEANUM, *d'Orb., Sagra, Cuba,* ii. 190. t. 24. f. 28, 29. B.M.

395. CREPIDULA ACULEATA, *Lamk., Sagra, Cuba,* ii. 191. B.M.

Patella fornicata aculeata, *Chemn.*
Patella aculeata, *Gmelin.*

396. CREPIDULA PROTEA, *d'Orb., Sagra, Cuba,* ii. 192. t. 24. f. 30–33. B.M.

Fam. 22. FISSURELLIDÆ.

397. EMARGINULA CLAUSA, *d'Orb., Sagra, Cuba,* ii. 194. t. 24. f. 34–36. B.M.

398. FISSURELLA PUSTULA, *d'Orb., Sagra, Cuba,* ii. 195. B.M.

Patella pustula, *Linn.*

399. FISSURELLA NIMBOSA, *Lamk., Sagra, Cuba,* ii. 195. B.M.

Patella nimbosa, *Linn.*

400. FISSURELLA BARBADENSIS, *Lamk., Sagra, Cuba,* ii. 196. B.M.

Patella Barbadensis, porphyrozonias, rosea, *Gmelin.*

401. FISSURELLA NODOSA, *Lamk., Sagra, Cuba,* ii. 197. B.M.

Patella nodosa, *Born.*
Patella Jamaicensis, *Gmelin.*

402. FISSURELLA LISTERI, *d'Orb., Sagra, Cuba,* ii. 197. t. 24. f. 37-39. B.M.

403. FISSURELLA ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 198. t. 24. f. 40-42. B.M.

404. PATELLA LEUCOPLEURA, *Gmelin, Sagra, Cuba,* ii. 198. B.M.

405. PATELLA CANDEANA, *d'Orb., Sagra, Cuba,* ii. 199. t. 25. f. 1-3. B.M.

406. PATELLA CUBANIANA, *d'Orb., Sagra, Cuba,* ii. 199. t. 25. f. 4-6. B.M.

Fam. 23. CHITONIDÆ.

407. CHITON GRANULATUS, *Gmelin, Sagra, Cuba,* ii. 200. B.M.

Chiton piceus, *Gmelin.*

Fam. 24. DENTALIDÆ.

408. DENTALIUM DOMINGUENSE, *d'Orb., Sagra, Cuba,* ii. 201. t. 25. f. 7-9. B.M.

409. DENTALIUM ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 202. t. 25. f. 10-13. B.M.

410. DENTALIUM DISPARILE, *d'Orb., Sagra, Cuba,* ii. 202. t. 25. f. 14-17. B.M.

Class IV. LAMELLIBRANCHIA.

Order I. ORTHOCONQUES.

Suborder I. SINUPALLEALES.

Fam. 1. CLAVAGELLIDÆ.

411. TEREDO NAVALIS, *Linn., Sagra, Cuba,* ii. 211. B.M.

Fam. 2. PHOLADIDÆ.

412. PHOLAS COSTATA, *Linn., Sagra, Cuba,* ii. 213. B.M.

413. PHOLAS PUSILLA, *Linn.*, *Sagra, Cuba,* ii. 214. B.M.
Pholas clavata, *Lamk.*

414. PHOLAS CANDEANA, *d'Orb.*, *Sagra, Cuba,* ii. 215. t. 25. f. 18, 19. B.M.

415. PHOLAS CARIBÆA, *d'Orb.*, *Sagra, Cuba,* ii. 216. t. 25. f. 20–22. B.M.

416. PHOLAS HORNBECKII, *d'Orb.*, *Sagra, Cuba,* ii. 217. t. 25. f. 23–25. B.M.

Fam. 3. MYACIDÆ.

417. SOLEN AMBIGUUS, *Lamk.*, *Sagra, Cuba,* ii. 220. B.M.

418. MACTRA FRAGILIS, *Chemn.*, *Sagra, Cuba,* ii. 222. B.M.
Mactra ovalina, *Lamk.*

Fam. 4. ANATINIDÆ.

419. LYONSIA BEANII, *d'Orb.*, *Sagra, Cuba,* ii. 225. t. 25. f. 26–28. B.M.

420. THRACIA RUGOSA, *Conrad, Sagra, Cuba,* ii. 226.

Fam. 5. SAXICAVIDÆ.

421. GASTROCHÆNA CUNEIFORMIS, *Spengler, Sagra, Cuba,* ii. 228. B.M.
Pholas hians, *Chemn.*

422. GASTROCHÆNA CHEMNITZIANA, *d'Orb.*, *Sagra, Cuba,* ii. 229. t. 25. f. 29, 30. B.M.
Pholas hians, *Chemn.*

Fam. 6. SOLECURTIDÆ.

423. SOLECURTUS CARIBÆUS, *d'Orb.*, *Sagra, Cuba,* ii. 231. B.M.
Solen Caribæus, *Lamk.*

424. SOLECURTUS BIDENS, *d'Orb.*, *Sagra, Cuba,* ii. 231. B.M.
Solen bidens, *Chemn.*

425. SOLECURTUS SANCTÆ-MARTHÆ, *d'Orb., Sagra, Cuba,* ii. 232. t. 25. f. 31, 32. B.M.
Solen Sanctæ-Marthæ, *Chemn.*

Fam. 7. TELLINIDÆ.

426. LAVIGNON LINEATA, *d'Orb., Sagra, Cuba,* ii. 235.
Lutraria papyracea, *Lamk.*, non *Chemn.*

427. LAVIGNON PETITIANA, *d'Orb., Sagra, Cuba,* ii. 236. t. 25. f. 33–35. B.M.

428. LAVIGNON ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 236. t. 25. f. 36, 38. B.M.

429. DONACILLA ROSEA, *d'Orb., Sagra, Cuba,* ii. 238. t. 25. f. 39, 40. B.M.

430. AMPHIDESMA VARIEGATA, *Lamk., Sagra, Cuba,* ii. 239. B.M.

431. AMPHIDESMA RETICULATA, *d'Orb., Sagra, Cuba,* ii. 240. B.M.
Tellina reticulata, *Linn.*

432. AMPHIDESMA CANCELLATA, *d'Orb., Sagra, Cuba,* ii. 241. t. 25. f. 42–44. B.M.

433. TELLINA PUNICEA, *Born, Sagra, Cuba,* ii. 243. B.M.
Donax Martinicensis, *Lamk.*
Tellina alternata, *Sow.*

434. TELLINA CARNARIA, *Linn., Sagra, Cuba,* ii. 244. B.M.
Lucina carnaria, *Lamk.*

435. TELLINA CONSTRICTA, *Philippi, Sagra, Cuba,* ii. 244. B.M.
Solen constrictus, *Brug.*
Tellina constricta, *Philippi.*
Psammobia Cayennensis, *Lamk.*

436. TELLINA LINEATA, *Turton, Sagra, Cuba,* ii. 245. B.M.
Tellina Brasiliana, *Lamk.*

437. TELLINA FAUSTA, *Dillwyn, Sagra, Cuba*, ii. 246. B.M.
Tellina remies, *Linn.*

438. TELLINA ROSEA, *Gmelin, Sagra, Cuba*, ii. 246. B.M.
Solen rosea, *Chemn.*
Solen sanguinolentus, *Gmelin.*
Sanguinolaria rosea, *Lamk.*
Psammobia rosea, *Desh.*

439. TELLINA INTERRUPTA, *Wood, Sagra, Cuba*, ii. 247. B.M.
Tellina interrupta, *Chemn.*
Tellina maculosa, *Lamk.*

440. TELLINA RADIATA, *Linn., Sagra, Cuba*, ii. 278. B.M.
Tellina unimaculata, *Lamk.*
Tellina nivea, *Wood.*

441. TELLINA FLEXUOSA, *Say, Sagra, Cuba*, ii. 248. B.M.
Tellina mirabilis, *Philippi.*

442. TELLINA PISIFORMIS, *Linn., Sagra, Cuba*, ii. 249.

443. TELLINA SIMILIS, *Sow., Sagra, Cuba*, ii. 249. B.M.

444. TELLINA ANTILLARUM, *d'Orb., Sagra, Cuba*, ii. 250. B.M.

445. TELLINA CARIBÆA, *d'Orb., Sagra, Cuba*, ii. 251. B.M.

446. TELLINA CANDEANA, *d'Orb., Sagra, Cuba*, ii. 251. t. 25. f. 50–52. B.M.

447. TELLINA EXILIS, *Lamk., Sagra, Cuba*, ii. 252. B.M.

448. TELLINA GUADALUPIENSIS, *d'Orb., Sagra, Cuba*, ii. 252. t. 26. f. 1–3. B.M.

449. TELLINA VITREA, *d'Orb., Sagra, Cuba*, ii. 253. t. 26. f. 4, 5. B.M.

450. TELLINA MARTINICENSIS, *d'Orb., Sagra, Cuba*, ii. 253. t. 26. f. 6–8. B.M.

451. TELLINA CONSOBRINA, *d'Orb., Sagra, Cuba,* ii. 254. t. 26. f. 9-11. B.M.

452. TELLINA VESPUCIANA, *d'Orb., Sagra, Cuba,* ii. 254. t. 26. f. 12-14. B.M.

453. TELLINA SIMPLEX, *d'Orb., Sagra, Cuba,* ii. 255. t. 26. f. 15-17. B.M.

454. TELLINA PAUPERATA, *d'Orb., Sagra, Cuba,* ii. 255. t. 26. f. 18-20. B.M.

455. TELLINA CUNEATA, *d'Orb., Sagra, Cuba,* ii. 256. t. 26. f. 21-23. B.M.

456. ARCOPAGIA BIMACULATA, *d'Orb., Sagra, Cuba,* ii. 257. t. 26. f. 24-26. B.M.
Tellina bimaculata, *Linn.*

457. CAPSA DEFLORATA, *d'Orb., Sagra, Cuba,* ii. 258. B.M.
Venus deflorata, *Linn.*
Tellina anomala, *Born.*
Sanguinolaria rugosa, *Lamk.*
Psammocola rugosa, *Blainv.*
Psammobia rugosa, *Sow.*

458. DONAX CAYANENSIS, *Lamk., Sagra, Cuba,* ii. 260. B.M.

459. DONAX RUGOSA, *d'Orb., Sagra, Cuba,* ii. 260. B.M.

Fam. 8. SOLENELLIDÆ.

460. LEDA VITREA, *d'Orb., Sagra, Cuba,* ii. 262. t. 26. f. 27-29. B.M.

461. LEDA JAMAICENSIS, *d'Orb., Sagra, Cuba,* ii. 263. t. 24. f. 30-32. B.M.

Fam. 9. VENUSIDÆ.

462. PETRICOLA PHOLADIFORMIS, *Lamk., Sagra, Cuba,* ii. 265. B.M.

463. PETRICOLA DIVARICATA, *d'Orb.*, *Sagra*, *Cuba*, ii. 265. B.M.

Venus lapicida, *Chemn.*
Venus divaricata, *Chemn.*
Venus divergens, *Gmelin.*

464. CYPRICARDIA HORNBECKIANA, *d'Orb.*, *Sagra*, *Cuba*, ii. 266. t. 26. f. 33, 34. B.M.

465. VENUS MACULATA, *Linn.*, *Sagra*, *Cuba*, ii. 269. B.M.

Cardium trigonium, *Martyn.*
Cytherea maculata, *Lamk.*

466. VENUS PHILIPPI, *d'Orb.*, *Sagra*, *Cuba*, ii. 270. B.M.

Cytherea concentrica, *Lamk.*
Cytherea Patagonica, *Philippi.*

467. VENUS FLEXUOSA, *Linn.*, *Sagra*, *Cuba*, ii. 270. B.M.

Cytherea flexuosa, *Lamk.*

468. VENUS DYSDERA, *Linn.*, *Sagra*, *Cuba*, ii. 271. B.M.

Cardium bicolor, *Martyn.*
Venus cancellata, *Lamk.*

469. VENUS RUBIGINOSA, *d'Orb.*, *Sagra*, *Cuba*, ii. 272. B.M.

Cytherea rubiginosa, *Philippi.*

470. VENUS PAPHIA, *Linn.*, *Sagra*, *Cuba*, ii. 273. B.M.

Anus rugosa, *Chemn.*

471. VENUS RUGOSA, *Chemn.*, *Sagra*, *Cuba*, ii. 273. B.M.

472. VENUS CONCENTRICA, *Born*, *Sagra*, *Cuba*, ii. 274.

Cytherea concentrica, *Lamk.*

473. VENUS DIONE, *Linn.*, *Sagra*, *Cuba*, ii. 274. B.M.

Cytherea Dione, *Lamk.*

474. VENUS CIRCINATA, *Born*, *Sagra*, *Cuba*, ii. 275. B.M.

Venus guinensis, *Gmelin.*
Cytherea guinensis, *Lamk.*

475. VENUS GRANULATA, *Gmelin, Sagra, Cuba,* ii. 276. B.M.
Venus marica, *Born.*
Venus violacea, *Gmelin.*

476. VENUS MACTROIDES, *Born, Sagra, Cuba,* ii. 276. B.M.
Venus corbicula, *Gmelin.*
Cytherea corbicula, *Lamk.*
Cytherea trigonella, *Philippi.*

477. VENUS AUBERIANA, *d'Orb., Sagra, Cuba,* ii. 277. t. 26. f. 35–37. B.M.

478. VENUS INÆQUIVALVIS, *d'Orb., Sagra, Cuba,* ii. 277. t. 26. f. 38–40. B.M.

479. VENUS ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 278. t. 26. f. 41–43. B.M.

480. VENUS CUBANIANA, *d'Orb., Sagra, Cuba,* ii. 278. t. 26. f. 44–46. B.M.

Fam. 10. CYCLASIDÆ.

481. CYCLAS MARITIMA, *d'Orb., Sagra, Cuba,* ii. 280. t. 26. f. 47–50. B.M.

Fam. 11. CORBULIDÆ.

482. CORBULA QUADRATA, *Hinds, Sagra, Cuba,* ii. 282.

483. CORBULA CUBANIANA, *d'Orb., Sagra, Cuba,* ii. 283. t. 26. f. 51–54. B.M.

484. CORBULA DISPARILIS, *d'Orb., Sagra, Cuba,* ii. 283. t. 27. f. 1–4. B.M.

485. CORBULA CARIBÆA, *d'Orb., Sagra, Cuba,* ii. 284. t. 27. f. 5–8. B.M.

486. CORBULA LAVALLEANA, *d'Orb., Sagra, Cuba,* ii. 284. t. 27. f. 9–12. B.M.

487. SPHENA CLERYANA, *d'Orb., Sagra, Cuba,* ii. 285.

488. SPHENA ORNATISSIMA, *d'Orb., Sagra, Cuba,* ii. 286. t. 27. f. 13–16. B.M.

489. SPHENA ALTERNATA, *d'Orb., Sagra, Cuba,* ii. 286. t. 27. f. 17–20. B.M.

Fam. 12. ASTARTIDÆ.

490. CRASSATELLA MARTINICENSIS, *d'Orb., Sagra, Cuba,* ii. 288. t. 27. f. 21–23. B.M.

491. CRASSATELLA GUADALUPENSIS, *d'Orb., Sagra, Cuba,* ii. 289. t. 27. f. 24–26. B.M.

Suborder II. INTEGROPALLEALES.

Fam. 13. CARDITIDÆ.

492. CARDITA DOMINGUENSIS, *d'Orb., Sagra, Cuba,* ii. 291. t. 27. f. 27–29. B.M.

493. TRIGONULINA ORNATA, *d'Orb., Sagra, Cuba,* ii. 292. t. 27. f. 30–33. B.M.

Fam. 14. LUCINIDÆ.

494. LUCINA JAMAICENSIS, *Lamk., Sagra, Cuba,* ii. 294. B.M.
Venus Jamaicensis, *Chemn.*

495. LUCINA QUADRISULCATA, *d'Orb., Sagra, Cuba,* ii. 294. t. 27. f. 34, 36. B.M.
Lucina divaricata, *Lamk.*

496. LUCINA SERRATA, *d'Orb., Sagra, Cuba,* ii. 295. t. 27. f. 37, 39. B.M.

497. LUCINA COSTATA, *d'Orb., Sagra, Cuba,* ii. 296. t. 27. f. 40–42. B.M.

498. LUCINA SEMIRETICULATA, *d'Orb., Sagra, Cuba,* ii. 297. B.M.

499. LUCINA TIGERRIMA, *Desh., Sagra, Cuba,* ii. 297. B.M.
Venus tigerrima, *Linn.*
Cytherea tigerrima, *Lamk.*

500. LUCINA MURICATA, *d'Orb., Sagra, Cuba,* ii. 298. B.M.
Tellina muricata, *Chemn.*
Lucina scabra, *Lamk.*

501. LUCINA CANDEANA, *d'Orb., Sagra, Cuba,* ii. 299. t. 27. f. 43-45. B.M.

502. LUCINA EDENTULA, *Lamk., Sagra, Cuba,* ii. 299. B.M.
Venus edentula, *Linn.*

503. LUCINA PENNSYLVANICA, *Lamk., Sagra, Cuba,* ii. 300. B.M.
Venus Pennsylvanica, *Linn.*

504. LUCINA TRISINUATA, *d'Orb., Sagra, Cuba,* ii. 300. t. 27. f. 46-49. B.M.

505. ERYCINA DONACINA, *Recluz, Sagra, Cuba,* ii. 302.

Fam. 15. CARDIDÆ.

506. CARDIUM SERRATUM, *Linn., Sagra, Cuba,* ii. 304. B.M.
Cardium lævigatum, *Gmelin.*

507. CARDIUM MURICATUM, *Linn., Sagra, Cuba,* ii. 305. B.M.

508. CARDIUM RINGICULUM, *Sow., Sagra, Cuba,* ii. 305.

509. CARDIUM LÆVIGATUM, *Linn., Sagra, Cuba,* ii. 306.

510. CARDIUM ANGULATUM, *Lamk., Sagra, Cuba,* ii. 306. B.M.
Cardium subelongatum, *Sow.*

511. CARDIUM MEDIUM, *Linn., Sagra, Cuba,* ii. 307. B.M.

512. CARDIUM ISOCARDIA, *Linn., Sagra, Cuba,* ii. 307. B.M.

513. CARDIUM BULLATUM, *Lamk., Sagra, Cuba,* ii. 308.
Solen bullatus, *Linn.*

514. CARDIUM PETITIANUM, *d'Orb., Sagra, Cuba,* ii. 309. t. 27. f. 50-52. B.M.

515. CARDIUM ANTILLARUM, *d'Orb., Sagra, Cuba,* ii. 309. t. 27. f. 53–55. B.M.

Fam. 16. NUCULIDÆ.

516. NUCULOCARDIA DIVARICATA, *d'Orb., Sagra, Cuba,* ii. 311. t. 27. f. 56–59. B.M.

Fam. 17. ARCACIDÆ.

517. PECTUNCULUS SERICATUS, *Reeve, Sagra, Cuba,* ii. 313.

518. PECTUNCULUS PECTINIFORMIS, *Lamk., Sagra, Cuba,* ii. 313.

Arca pectunculus, *Linn.*
Pectunculus oculatus, *Reeve.*

519. PECTUNCULUS VARIEGATUS, *d'Orb., Sagra, Cuba,* ii. 314.

Arca variegata, *Chemn.*
Pectunculus castaneus, *Lamk.*

520. PECTUNCULUS UNDATUS, *d'Orb., Sagra, Cuba,* ii. 314. B.M.

Arca undata, *Linn.*
Pectunculus pennaceus, *Lamk.*
Pectunculus lineatus, *Reeve.*

521. ARCA AMERICANA, *d'Orb., Sagra, Cuba,* ii. 317. t. 28. f. 1, 2. B.M.

522. ARCA BICOPS, *Philippi, Sagra, Cuba,* ii. 318.

Arca rhombea, var., *Chemn.*
Arca Brasiliana, *Lamk.*

523. ARCA FUSCA, *Brug., Sagra, Cuba,* ii. 319. B.M.

524. ARCA CANDIDA, *Chemn., Sagra, Cuba,* ii. 319. B.M.

Arca Jamaicensis, *Gmelin.*
Arca Helbingii, *Brug.*

525. ARCA PEXATA, *Say, Sagra, Cuba,* ii. 320. B.M.
Arca Americana, *Gray.*

526. ARCA AURICULATA, *Lamk., Sagra, Cuba,* ii. 321.

527. ARCA BARBADENSIS, *Petiver, Sagra, Cuba,* ii. 321. B.M.
Mytulus Barbadensis, *Petiver.*

528. ARCA HEMIDERMOS, *Philippi, Sagra, Cuba,* ii. 322. B.M.
Arca antiquata, *Linn.*
Arca Deshayesii, *Philippi.*

Fam. 18. MYTILIDÆ.

529. PINNA PERNULA, *Chemn., Sagra, Cuba,* ii. 325. B.M.
Pinna varicosa, *Lamk.*

530. PINNA RIGIDA, *Solander, Sagra, Cuba,* ii. 325. B.M.
Pinna nobilis, *Chemn.*
Pinna seminuda, *Lamk.*

531. MYTILUS VIATOR, *d'Orb., Sagra, Cuba,* ii. 327. B.M.
Mytilus impactus, *Dillwyn.*

532. MYTILUS DOMINGUENSIS, *Lamk., Sagra, Cuba,* ii. 328. B.M.
Mytilus exustus, *Lamk.,* not *Gmelin.*

533. MYTILUS LAVALLEANUS, *d'Orb., Sagra, Cuba,* ii. 328. t. 28. f. 3–5. B.M.

534. MYTILUS EXUSTUS, *Linn., Sagra, Cuba,* ii. 329. B.M.
Mytilus citrinus polydentatus, *Chemn.*

535. MYTILUS AMERICANUS, *Favart, Sagra, Cuba,* ii. 329. B.M.
Mytilus modiolus, *Chemn.,* not *Linn.*
Modiola tulipa, *Lamk.* part.

536. LITHODOMUS NIGER, *d'Orb., Sagra, Cuba,* ii. 331. t. 28. f. 10, 11. B.M.
Modiola lithophagus, var., *Lamk.*

537. LITHODOMUS ANTILLARUM, *d'Orb.*, *Sagra, Cuba*, ii. 332. t. 28. f. 12, 13. B.M.

538. LITHODOMUS BISULCATUS, *d'Orb.*, *Sagra, Cuba*, ii. 333. t. 28. f. 14–16. B.M.

539. LITHODOMUS CINNAMOMEUS, *d'Orb.*, *Sagra, Cuba*, ii. 333. B.M.

Mytilus cinnamomeus, *Chemn.*
Modiola cinnamomea, *Lamk.*

Fam. 19. LIMIDÆ.

540. LIMA SCABRA, *Sowerby*, *Sagra, Cuba*, ii. 336. B.M.

Ostrea scabra, *Born.*
Lima aspera, *Chemn.*
Ostrea glacialis, *Gmelin.*
Lima glacialis, *Lamk.*

541. LIMA CARIBÆA, *d'Orb.*, *Sagra, Cuba*, ii. 337. t. 28. f. 17–19. B.M.

Lima squamosa, var., *Lamk.*

542. LIMA CUBANIANA, *d'Orb.*, *Sagra, Cuba*, ii. 337. t. 28. f. 20–22. B.M.

Order II. PLEUROCONQUES.

Fam. 1. AVICULIDÆ.

543. AVICULA SQUAMULOSA, *Lamk.*, *Sagra, Cuba*, ii. 342. B.M.

Mytilus margaritiferus, *Gmelin.*

544. AVICULA GUADALOUPENSIS, *d'Orb.*, *Sagra, Cuba*, ii. 343. t. 28. f. 23, 24. B.M.

545. AVICULA CANDEANA, *d'Orb.*, *Sagra, Cuba*, ii. 343. t. 28. f. 25–27. B.M.

546. PERNA OBLIQUA, *Lamk.*, *Sagra, Cuba*, ii. 346. B.M.

547. PERNA CHEMNITZIANA, *d'Orb., Sagra, Cuba,* ii. 346. B.M.

Concha semiaurita, *Chemn.*

548. PERNA LAMARCKIANA, *d'Orb., Sagra, Cuba,* ii. 347. B.M.

Perna vulsella *β.*, *Lamk.*

Fam. 2. PECTINIDÆ.

549. PECTEN GIBBUS, *Lamk., Sagra, Cuba,* ii. 352. B.M.

Ostrea gibba, *Linn.*
Ostrea turgida, *Gmelin.*
Pecten turgidus, *Lamk.*

550. PECTEN NODOSUS, *Lamk., Sagra, Cuba,* ii. 353. B.M.

Ostrea nodosa, *Linn.*
Pecten corallinus, *Chemn.*

551. PECTEN ORNATUS, *Lamk., Sagra, Cuba,* ii. 353. B.M.

552. JANIRA ZIGZAG, *d'Orb., Sagra, Cuba,* ii. 356. B.M.

Ostrea zigzag, *Linn.*

553. SPONDYLUS FOLIA-BRASSICÆ, *Chemn., Sagra, Cuba,* ii. 358. B.M.

Spondylus gæderopus, var., *Chemn.*
Spondylus Americanus, *Lamk.*

554. SPONDYLUS ECHINATUS, *d'Orb., Sagra, Cuba,* ii. 359.

Spondylus gæderopus, var., *Chemn.*
Ostrea echinata, *Martyn.*
Spondylus longitudinalis, *Lamk.*

555. PLICATULA BARBADENSIS, *Petiver, Sagra, Cuba,* ii. 360. B.M.

Spondylus Barbadensis, *Petiver.*
Spondylus plicatus, var., *Linn.*
Plicatula ramosa, P. depressa, P. reniformis et P. cristata, *Lamk.*

Fam. 3. CHAMACIDÆ.

556. CHAMA ARCINELLA, *Linn.*, *Sagra, Cuba*, ii. 362. t. 28. f. 28, 29. B.M.

Cardium crista-galli, *Martyn.*
Arcinella spinosa, *Schum.*

557. CHAMA MACROPHYLLA, *Linn.*, *Sagra, Cuba*, ii. 363. B.M.

Chama Lazarus, *Lamk.*

Fam. 4. OSTRACIDÆ.

558. OSTREA SPRETA, *d'Orb.*, *Sagra, Cuba*, ii. 365. t. 28. f. 30. B.M.

559. OSTREA FOLIUM, *Linn.*, *Sagra, Cuba*, ii. 365. B.M.

Ostrea limacella et O. rubella, var., *Lamk.*

560. ANOMIA SIMPLEX, *d'Orb.*, *Sagra, Cuba*, ii. 367. t. 28. f. 31–33. B.M.

561. ORBICULA ANTILLARUM, *d'Orb.*, *Sagra, Cuba*, ii. 368. t. 28. f. 34–36. B.M.

Note on certain Species. By DR. GRAY.

101–105. Pupa, § 11, viz. Pupa brevis, P. Oviedoiana, P. Lavalleana, P. Auberiana, P. Poëyana, = species of Bradypus or Cylindrella.

107. Auricula ovula = Voluta triplicata, *Donovan, Brit. Shells*, iv. t. 128.

108. Auricula oliva = Voluta bullaoides, *Montague, Test. Brit.* t. 30. f. 4; Auricula bulloides, *Gray*, 1825 = Detracia, *Gray*, 1840.

109. Physa Sowerbyana = Bulla rivalis, *Maton, Linn. Trans.* viii. t. 4. f. 2.

144. Siphonaria lineolata = no. 404, Patella leucopleura, *Gmelin*,—a Patella or Tectura, not a Siphonaria.

147. Vermetus corrodens = Spiroglyphus, sp.

148, 149. Odontostoma = Proserpina, sp., *Gray*.

309. Cancellaria Candei = Phos, sp.

330. Purpura accincta = Pollia, sp.

334. Sinusigera cancellata = Struthiolaria microscopica, *Gray*, *Beechey*, *Voy.* = Cheletropis, *Edw. Forbes*, 1851.

393. Calyptræa equestris = Patella equestris, *Dillw.* = Calyptræa Dillwynii, *Gray*, 1825. *Var.* C. Tectum Chinensis, distinct from Calyptræa equestris, *Lamk.* = Patella Neptunii, *Dillw.*

397. Emarginula clausa = Patella octoradiatá, *Gmelin*, 3699; *Lister*, t. 532. f. 11. *Var.* P. tricarinata, *Born*, t. 18. f. 62 = Emarginula octoradiata, *Gray*, 1825, a most variable species.

404. Patella leucopleura = (see no. 144) Siphonaria lineolata, the same shell.

424. Solecurtus bidens = S. fragilis, *Solander*, *Montague*, *Test. Brit.*

429. Donacilla rosea = Tellina bimaculata, *Linn.*, T. variegata, *Solander*. See no. 456,—is evidently the same shell.

456. Arcopagia bimaculata = no. 429, Donacilla rosea.

463. Petricola divaricata = Choristodon typicum, *Jonas*, Naranio costata, *Gray*.

464. Cypricardia Hornbeckiana = Coralliophaga, *Blainv.*

Printed by Taylor and Francis, Red Lion Court, Fleet Street.

CATALOGUES

OF

THE ZOOLOGICAL COLLECTION

IN

THE BRITISH MUSEUM.

I. VERTEBRATA.

List of Mammalia. By Dr. J. E. GRAY, F.R.S. &c. 1843. 2*s.* 6*d.*

Catalogue of the Mammalia. By Dr. J. E. GRAY, F.R.S. &c.

Part 1. Cetacea. 12mo, 1850. 4*s.*, with Plates.
Part 2. Seals. 12mo, 1850. 1*s.* 6*d.*, with Woodcuts.
Part 3. Hoofed Quadrupeds. Section I. (Ungulata furcipeda) 1852, with Plates of Genera, 12*s.*

This work contains the description of the genera and species, and figures of the chief characters of the genera.

List of Mammalia and Birds of Nepaul, presented by B. H. Hodgson, Esq., to the British Museum. By Dr. J. E. GRAY and G. R. GRAY. 1846. 2*s.*

List of Birds. By G. R. GRAY, F.L.S. &c.

Part 1. Raptorial. Edition 1, 1844; edition 2, 1848. 3*s.*
Part 2. Passeres. Section I. Fissirostres. 1848. 2*s.*
Part 3. Gallinæ, Grallæ and Anseres. 1844. 2*s.*

The other sections of the Passerine birds are in progress.

List of British Birds. By G. R. GRAY, F.L.S. &c. 1850. 4*s.*

List of the Eggs of British Birds. By G. R. GRAY, F.L.S. &c. 1852. 2*s.* 6*d.*

Catalogue of Reptiles. By Dr. J. E. GRAY, F.R.S., V.P.Z.S. &c.

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Part 2. Lizards. 1845. 3*s.* 6*d.*
Part 3. Snakes (Crotalidæ, Viperidæ, Hydridæ and Boidæ). 1849. 2*s.* 6*d.*
Part 4, completing the Snakes (Colubridæ), is in preparation.

Catalogue of Amphibia. By Dr. J. E. GRAY, F.R.S., V.P.Z.S.

Part 2. Batrachia Gradientia. 12mo, 1850. 2*s.* 6*d.* with Plates of the Skull and Teeth.

Catalogue of Fish. By Dr. J. E. GRAY, F.R.S., V.P.Z.S.

Part 1. Cartilaginous Fish. 12mo, 1851. 3*s*. With two Plates.

These Catalogues of *Reptiles*, *Amphibia*, and *Fish*, contain the characters of all the genera and species at present known; the latter are illustrated with figures of the genera.

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List of Osteological Specimens. By Dr. J. E. GRAY, F.R.S. &c. and G. R. GRAY, F.L.S. 1847. 2*s*.

II. ANNULOSA.

Catalogue of Lepidoptera. By G. R. GRAY, F.L.S.

Part 1. Papilionidæ, with coloured figures of the new species. £1 : 5*s*. 4to, 1852.

List of Lepidopterous Insects. By E. DOUBLEDAY, F.L.S.

Part 1. Papilionidæ, &c. 1844. 2*s*. 6*d*.
Part 2. Erycinidæ, &c. 1847. 9*d*.
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The Catalogue of *Hemiptera* contains the description of the new species in the Museum Collection, and figures of the more interesting genera.

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Part 2. Hydrocanthari. 1847. 1*s*. 3*d*. By A. WHITE, F.L.S.
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List of Crustacea; with Synonyma. By A. WHITE. 1847. 2*s*.

List of Myriapoda. By G. NEWPORT, F.R.S. &c. 1844. 4*d*.

List of British Lepidoptera; with Synonyma. By J. F. STEPHENS, F.L.S. Part 1. 1850. 5*s*. Part 2. 1852. 2*s*. Part 3. 1853. 9*d*.

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Catalogue of Entozoa; with Plates. By W. BAIRD, M.D., F.L.S. 1853. 2*s*.

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Catalogue of the Mollusca in the Collection of the British Museum. By Dr. J. E. GRAY, F.R.S., &c.

Part 1. Cephalopoda Antepedia. 1849. 4*s*.
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Part 1. Echinida irregularia. 12mo, with Plates.

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List of British Sponges; with Synonyma. By Dr. J. E. GRAY, F.R.S. 1848. 10*d.*

V. BRITISH ZOOLOGY.

List of the British Animals; with Synonyma and references to figures.

Part 1. Radiata. By Dr. J. E. GRAY. 1848. 4*s.*
Part 2. Sponges. By Dr. J. E. GRAY. 1848. 10*d.*
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N.B.—These Catalogues can be obtained at the Secretary's Office in the BRITISH MUSEUM; of Messrs. LONGMAN & Co.; or of any Bookseller.

LIST

OF THE

SHELLS OF SOUTH AMERICA

IN

THE COLLECTION

OF THE

BRITISH MUSEUM.

COLLECTED AND DESCRIBED BY

M. ALCIDE D'ORBIGNY,

In the "Voyage dans l'Amérique Méridionale."

LONDON:

PRINTED BY ORDER OF THE TRUSTEES.

1854.

PRINTED BY TAYLOR AND FRANCIS,
RED LION COURT, FLEET STREET.

PREFACE.

THE specimens of SHELLS in the following List marked B.M. were received from Professor Alcide d'Orbigny, as the type specimens, collected, described and figured by him in the Mollusca Part of the "Voyage dans l'Amérique Méridionale, le Brésil, la république orientale de l'Uruguay, la république Argentine, la Patagonie, la république du Chili, la république de Bolivia, la république de Pérou, exécuté pendant les années 1826 à 1833, par Alcide d'Orbigny. Ouvrage dédié au Roi, et publié sous les auspices de M. le Ministre de l'Instruction publique." Paris, 4to. 1847.

The specimens are fastened on their original Pasteboard Trays, named by M. d'Orbigny, and marked with their special habitats; and generally there is a series of different ages of each species, especially of those from the South American rivers and ponds.

JOHN EDWARD GRAY.

1 Oct. 1854.

LIST

OF THE

MOLLUSCA OF SOUTH AMERICA.

N.B. The species of Shells received by the British Museum from M. d'Orbigny are marked B.M. in the outer margin.

Class I. CEPHALOPODA.

Order I. ACETABULIFERA.

Fam. 1. OCTOPODÆ.

1. Argonauta hians, *Soland., d'Orb. Voy.* v. 12.
   Shores of America (Nov.).
2. Philonexis Quoyanus, *d'Orb. Voy.* v. 17. t. 2. f. 6–8.
   Pacific Ocean.
3. Philonexis Atlanticus, *d'Orb. Voy.* v. 19. t. 2. f. 1–4.
   Atlantic Ocean; Tropics.
4. Philonexis Eylais, *d'Orb. Voy.* v. 20. t. 1. f. 8, 11.
   Atlantic Ocean.

5. PHILONEXIS BREVIPES, *d'Orb. Voy.* v. 22. t. 1. f. 1, 3.
Atlantic Ocean.

6. PHILONEXIS MINIMUS, *d'Orb. Voy.* v. 23. t. 1. f. 4, 5.
Pacific Ocean (Sept.).

7. OCTOPUS TEHUELCHUS, *d'Orb. Voy.* v. 27. t. 1. f. 6, 7.
Shores of Patagonia.

8. OCTOPUS FONTANIANUS, *d'Orb. Voy.* v. 28. t. 2. f. 6.

Fam. 2. DECAPODÆ.

9. CRANCHIA CARDIOPTERA, *Peron, d'Orb. Voy.* v. 34.
Atlantic Ocean.

10. ONYCHOTEUTHIS PERATOPTERA, *d'Orb. Voy.* v. 39. t. 3. f. 5, 7.
Coast of Chili.

11. ONYCHOTEUTHIS PLATYPTERA, *d'Orb. Voy.* v. 41. t. 3. f. 8, 11.
Atlantic.

12. ONYCHOTEUTHIS ANGULATA, *Lesueur, d'Orb. Voy.* v. 42.
Atlantic.

13. OMMASTREPHES GIGAS, *d'Orb. Voy.* v. 50.
Loligo gigas, *d'Orb. Voy.* v. t. 4.
Chili.

14. OMMASTREPHES CYLINDRACEUS, *d'Orb. Voy.* v. 54.
Loligo cylindraceus, *d'Orb. Voy.* v. t. 3. f. 34.

15. OMMASTREPHES BARTRAMII, *d'Orb. Voy.* v. 55. B.M.
Loligo Bartramii, *Lesueur.*
Southern Hemisphere.

16. LOLIGO GAHI, *d'Orb. Voy.* v. 60. t. 3. f. 1, 2.
Coast of Chili.

17. LOLIGO BREVIS, *Blainv., d'Orb. Voy.* v. 62.
Rio de Janeiro.

18. LOLIGO BRASILIENSIS, *Blainv., d'Orb. Voy.* v. 63. B.M.
Rio de Janeiro.

Class II. PTEROPODA.

Fam. 1. HYALINEA.

19. HYALÆA FORSKALII, *Lesueur, d'Orb. Voy.* v. 89. t. 5. f. 1–5. B.M.
Hyalæa tridentata, *Bosc.*
Hyalæa cornea, *Roissy.*
Anomia tridentata, *Gmelin.*
Cavolina natans, *Abild.*
Hyalæa papilionacea, *Bory.*
Hyalæa Chemnitziana, *Peron & Lesueur.*

20. HYALÆA AFFINIS, *d'Orb. Voy.* v. 91. t. 5. f. 6–10. B.M.

21. HYALÆA UNCINATA, *Rang, d'Orb. Voy.* v. 93. t. 5. f. 11–15. B.M.

22. HYALÆA GIBBOSA, *Rang, d'Orb. Voy.* v. 95. t. 5. f. 16, 20. B.M.

23. HYALÆA FLAVA, *d'Orb. Voy.* v. 97. t. 5. f. 21, 25. B.M.

24. HYALÆA QUADRIDENTATA, *Lesueur, d'Orb. Voy.* v. 98. t. 6. f. 1–5. B.M.

25. HYALÆA LONGIROSTRA, *Lesueur, d'Orb. Voy.* v. 100. t. 6. f. 6–10. B.M.

26. HYALÆA LIMBATA, *d'Orb. Voy.* v. 101. t. 6. f. 11–15. B.M.
Hyalæa longirostris, *Quoy & Gaim.*

27. HYALÆA INFLEXA, *Lesueur, d'Orb. Voy.* v. 103. t. 6. f. 16, 20. B.M.

28. HYALÆA LABIATA, *d'Orb. Voy.* v. 104. t. 6. f. 21, 25. B.M.

29. HYALÆA TRISPINOSA, *Lesueur, d'Orb. Voy.* v. 106. t. 7. f. 1–5; t. 20. f. 1, 2. B.M.

30. HYALÆA MUCRONATA, *Quoy & Gaim., d'Orb. Voy.* v. 108. t. 7. f. 6, 10. B.M.

Hyalæa trispinosa, *Quoy & Gaim.*

31. HYALÆA DEPRESSA, *d'Orb. Voy.* v. 110. t. 7. f. 11, 14.

32. HYALÆA LÆVIGATA, *d'Orb. Voy.* v. 110. t. 7. f. 15, 19. B.M.

33. HYALÆA (CLEODORA) CUSPIDATA, *Bosc, d'Orb. Voy.* v. 112. t. 7. f. 20, 24. B.M.

Cleodora cuspidata, *Quoy.*
Cleodora Lessonii, *Rang.*
Cleodora quadrispinosa, *Rang.*

34. HYALÆA (CLEODORA) PYRAMIDATA, *Bosc, d'Orb. Voy.* v. 113. t. 7. f. 30, 32. B.M.

Clio pyramida, *Browne.*
Hyalæa lanceolata, *Lesueur.*
Cleodora lanceolata, *Rang.*
Clio caudata, *Browne.*
Hyalæa caudata, *Rang.*

Var. *a.* t. 7. f. 25, 29.
Var. *β.* t. 8. f. 32, 33.

35. HYALÆA (CLEODORA) BALANTIUM, *d'Orb. Voy.* v. 116. t. 8. f. 1–4.

Balantium, *Children, Journ. Roy. Inst.* xv. 220. f. 7.

36. HYALÆA (CLEODORA) AUSTRALIS, *d'Orb. Voy.* v. 117. t. 8. f. 9–11. B.M.

37. HYALÆA (CLEODORA) RUGOSA, *d'Orb. Voy.* v. 118. t. 8. f. 12–14.

38. HYALÆA (CRESIS) SUBULA, *Quoy & Gaim., d'Orb. Voy.* v. 119. t. 8. f. 15–19. B.M.

Cleodora subula, *Quoy.*
Cresis spinifera, *Rang.*

39. HYALÆA (CRESIS) CORNIFORMIS, *d'Orb. Voy.* v. 120. t. 8. f. 20, 23. B.M.

40. HYALÆA (CRESIS) VIRGULA, *d'Orb. Voy.* v. 121. t. 8. f. 26, 28. B.M.

Cresis virgula, *Rang.*

41. HYALÆA (CRESIS) STRIATA, *d'Orb. Voy.* v. 122. t. 8. f. 23, 25. B.M.

Cresis striata, *Rang.*

42. HYALÆA (CRESIS) ACICULATA, *d'Orb. Voy.* v. 123. t. 8. f. 29, 31. B.M.

Cresis aciculata, *Rang.*
Cresis clava, *Rang.*

43. CUVIERIA COLUMELLA, *Rang, d'Orb. Voy.* v. 125. t. 8. f. 35, 39. B.M.

Cleodora obtusa, *Quoy & Gaim.*
Cresis obtusa, *Rang.*

44. PNEUMODERMON VIOLACEUM, *d'Orb. Voy.* v. 129. t. 9. f. 10–15.

Atlantic Ocean.

45. SPONGIOBRANCHIA AUSTRALIS, *d'Orb. Voy.* v. 131. t. 9. f. 1–6.

Atlantic Ocean.

46. SPONGIOBRANCHIA ELONGATA, *d'Orb. Voy.* v. 132. t. 9. f. 8, 9.

47. CYMODOCE DIAPHANA, *d'Orb. Voy.* v. 133. t. 9. f. 16, 17.

Class III. HETEROPODA.

Fam. 1. NUCLEOBRANCHEÆ.

48. SAGITA TRIPTERA, *d'Orb. Voy.* v. 142. t. 10. f. 1, 3.

49. SAGITA EXAPTERA, *d'Orb. Voy.* v. 143. t. 10. f. 4, 5.

50. SAGITA APTERA, *d'Orb. Voy.* v. 143. t. 10. f. 6, 7.

51. Firola (Anops) Peronii, *d'Orb. Voy.* v. 147. t. 10. f. 8–10.

52. Firola (Firola) Quoyana, *d'Orb. Voy.* v. 150. t. 11. f. 1, 2.

53. Firola (Cerophora) Lesueurii, *d'Orb. Voy.* v. 151. t. 10. f. 11, 12.

54. Firola (Cerophora) Gaimardii, *d'Orb. Voy.* v. 153. t. 10. f. 13, 14.

55. Cardiophora pedunculata, *d'Orb. Voy.* v. 156. t. 11. f. 5.

56. Cardiophora carinata, *d'Orb. Voy.* v. 157. t. 11. f. 3, 4.

57. Carinaria punctata, v. 160. t. 11. f. 6–15. B.M.

Fam. 2. ATLANTIDEÆ.

58. Atlanta (Helicophlegma) Keraudrenii, *Rang, d'Orb. Voy.* v. 169. t. 9. f. 16, 23; t. 20. f. 34. B.M.

59. Atlanta (Atlanta) Peronii, *Lesueur, d'Orb. Voy.* v. 171. t. 12. f. 1, 15. B.M.

Atlanta Keraudrenii, *Quoy & Gaimard.*
Corne d'Ammon, *Lamanon.*

60. Atlanta turriculata, *d'Orb. Voy.* v. 173. t. 20. f. 5, 11. B.M.

61. Atlanta (Heliconoides) inflata, *d'Orb. Voy.* v. 174. t. 12. f. 16, 19. B.M.

62. Atlanta (Heliconoides) rotunda, *d'Orb. Voy.* v. 175. t. 12. f. 20, 24. B.M.

63. Atlanta (Heliconoides) Rangii, *d'Orb. Voy.* v. 176. t. 12. f. 25, 28. B.M.

64. Atlanta (Heliconoides) Lesueurii, *d'Orb. Voy.* v. 177. t. 20. f. 12, 15. B.M.

65. ATLANTA (HELICONOIDES) TROCHIFORMIS, *d'Orb. Voy.* v. 177. t. 12. f. 29, 31.

66. ATLANTA (HELICONOIDES) RETICULATA, *d'Orb. Voy.* v. 178. t. 12. f. 32, 35 & 39. B.M.

67. ATLANTA (HELICONOIDES) BULLINOIDES, *d'Orb. Voy.* v. 179. t. 12. f. 36, 38.

Fam. 3. PHYLLIROIDEÆ.

68. PHYLLIROË ROSEUM, *d'Orb. Voy.* v. 183. t. 20. f. 16, 17.

Class IV. GASTEROPODA.

Order I. NUDIBRANCHIA.

69. DORIS VARIOLATA, *d'Orb. Voy.* v. 186. t. 16. f. 1, 3.
Chili.

70. DORIS PUNCTUOLATA, *d'Orb. Voy.* v. 187. t. 16. f. 4–6.
Chili.

71. DORIS PERUVIANA, *d'Orb. Voy.* v. 188. t. 15. f. 7–9.
Peru.

72. DORIS HISPIDA, *d'Orb. Voy.* v. 188. t. 15. f. 4–6.
Chili; Valparaiso.

73. DORIS FONTAINII, *d'Orb. Voy.* v. 189. t. 15. f. 1, 3.
Chili.

74. CAVOLINA PATAGONICA, *d'Orb. Voy.* v. 192. t. 14. f. 4, 7.
North Patagonia.

75. CAVOLINA INCA, *d'Orb. Voy.* v. 193. t. 13. f. 1–7.
Chili and Peru.

76. CAVOLINA NATANS, *d'Orb. Voy.* v. 195. t. 13. f. 8–10.
Peru.

77. GLAUCUS DISTICHUS, *d'Orb. Voy.* v. 196. t. 14. f. 1, 3.
Peru.

Order II. INFEROBRANCHIA.

78. DIPHYLLIDIA CUVIERI, *d'Orb. Voy.* v. 199. t. 17. f. 1–3.
Chili; Valparaiso.

Order III. TECTIBRANCHIA.

79. POSTEROBRANCHÆA MACULATA, *d'Orb. Voy.* v. 203. t. 17. f. 6, 9.

80. PLEUROBRANCHUS PATAGONICUS, *d'Orb. Voy.* v. 204. t. 17. f. 4, 5.

81. APLYSIA LIVIDA, *d'Orb. Voy.* v. 206. t. 18. f. 3, 5.
Brazils.

82. APLYSIA INCA, *d'Orb. Voy.* v. 207. t. 14. f. 13.
Peru.

83. APLYSIA NIGRA, *d'Orb. Voy.* v. 209. t. 18. f. 1, 2.
Peru.

84. APLYSIA RANGIANA, *d'Orb. Voy.* v. 210. t. 17. f. 11, 13.
Peru.

85. BULLA PERUVIANA, *d'Orb. Voy.* v. 211. B.M.
Bulla hydatis, *d'Orb. Voy.* t. 19. f. 4, 5.
Peru.

86. BULLA STRIATA, *Brug.*, *d'Orb. Voy.* v. 212. B.M.
Brazils.

Order IV. PULMOBRANCHIA.

Suborder I. GEOPHILES.

Fam. 1. LIMACEA (*Limaciens*).

87. VAGINULUS LIMAYANUS, *Lesson*, *d'Orb. Voy.* v. 219.
Lima.

88. VAGINULUS SOLEA, *d'Orb. Voy.* v. 220. t. 21. f. 1–4.
Vaginulus soleiformis, *d'Orb. Syn.*
Bolivia.

89. LIMAX ANDECOLUS, *d'Orb. Voy.* v. 222.
Andes.

90. LIMAX ÆQUINOCTIALIS, *d'Orb. Voy.* v. 222.
Guayaquil.

Fam. 2. COLIMACEA.

91. SUCCINEA (OMALONYX) UNGUIS, *d'Orb. Voy.* v. 229. t. 22. f. 1–7. B.M.
Helix (Cochlohydra) unguis, *Féruss.*
Bolivia.

92. SUCCINEA GAYANA, *d'Orb. Voy.* v. 230. t. 22. f. 8–11. B.M.
Helix Gayana, *d'Orb.*
Chili.

93. SUCCINEA EQUINOCTIALIS, *d'Orb. Voy.* v. 231. B.M.
Helix putris, *Syn.* 2.
Guayaquil.

94. SUCCINEA OBLONGA, *Drap., d'Orb. Voy.* v. 231. B.M.
Helix elongata, *Syn.* 4.
S. America.

95. HELIX COMBOIDES, *d'Orb. Voy.* v. 233. t. 23. f. 14–18. B.M.
Bolivia.

96. HELIX TRIODONTA, *d'Orb. Voy.* v. 234. t. 24. f. 1, 3. B.M.
Equator; Island of Puna.

97. HELIX CHEILOSTROPHA, *d'Orb. Voy.* v. 235. t. 23. f. 5, 8.
Bolivia.

98. HELIX POLLODONTA, *d'Orb. Voy.* v. 236. t. 23. f. 9, 13. B.M
Bolivia.

99. HELIX HELIGMOIDA, *d'Orb. Voy.* v. 237. t. 23. f. 1, 4. B.M.
Guayaquil.

100. HELIX LACTEA, *Müller, d'Orb. Voy.* v. 238. B.M.
Montevideo; introduced from Teneriffe.

101. HELIX AUDOUINII, *d'Orb. Voy.* v. 239. t. 24. f. 4–6. B.M.
Bolivia.

102. HELIX ORESIGENA, *d'Orb. Voy.* v. 240. t. 25. f. 1–4. B.M.
Bolivia.

103. HELIX ESTELLA, *d'Orb. Voy.* v. 241. t. 25. f. 5–8. B.M.
Bolivia.

104. HELIX TRIGRAMMEPHORA, *d'Orb. Voy.* v. 242. t. 25. f. 9–11. B.M.
Bolivia.

105. HELIX SIMILARIS, *Féruss., d'Orb. Voy.* v. 243. B.M.
Brazils.

106. HELIX SERPENS, *Féruss., d'Orb. Voy.* v. 244. B.M.
Brazils.

107. HELIX HELIACA, *d'Orb. Voy.* v. 244. t. 26. f. 1-5. B.M.
Bolivia; Brazils.

108. HELIX (HELICELLA) HELICYCLOIDES, *d'Orb. Voy.* v. 246. t. 28. f. 1-4. B.M.
Bolivia.

109. HELIX DISSIMILIS, *d'Orb. Voy.* v. 247. t. 26. f. 18-21. B.M.
Chili.

110. HELIX INSIGNIS, *d'Orb. Voy.* v. 247. t. 26. f. 14-17. B.M.
Guayaquil.

111. HELIX AMMONIFORMIS, *d'Orb. Voy.* v. 248. t. 26. f. 10-13. B.M.
Bolivia.

112. HELIX OMALOMORPHA, *d'Orb. Voy.* v. 249. t. 27. f. 1-3. B.M.
Bolivia.

113. HELIX SKIAPHILA, *d'Orb. Voy.* v. 249. t. 27. f. 4-7. B.M.
Bolivia.

114. HELIX ORBICULA, *d'Orb. Voy.* v. 250. t. 27. f. 16-19. B.M.
Bolivia.

115. HELIX CHALICOPHILA, *d'Orb. Voy.* v. 251. t. 27. f. 8-11. B.M.
Bolivia.

116. HELIX TROCHILIONEIDES, *d'Orb. Voy.* v. 251. t. 27. f. 12-15. B.M.
Bolivia.

117. HELIX COSTELLATA, *d'Orb. Voy.* v. 252. t. 26. f. 6–9. B.M.
Montevideo.

118. HELIX BOUNOBŒNA, *d'Orb. Voy.* v. 253. t. 28. f. 17–20. B.M.
Bolivia.

119. HELIX HYLEPHILA, *d'Orb. Voy.* v. 253. t. 28. f. 9–16. B.M.
Bolivia.

120. HELIX ELEVATA, *d'Orb. Voy.* v. 254. t. 28. f. 5–8. B.M.
Montevideo.

121. HELIX PROGASTOR, *d'Orb. Voy.* v. 255. t. 22. f. 12–15. B.M.

122. BULIMUS MULLERI, *Brug., d'Orb. Voy.* v. 256. B.M.
Helix Mülleri, *Féruss.*
Buccinum striatum, *Müller.*
Bulimus striatus, *Brug.*
Bolivia.

123. BULIMUS UNILAMELLATUS, *d'Orb. Voy.* v. 257. B.M.
Helix unilamellata, *d'Orb.*
Bolivia.

124. BULIMUS REGINA, *d'Orb. Voy.* v. 257. t. 29. f. 4, 5. B.M.
Helix regina, *Féruss.*
Achatina perversa, *Swains.*
Achatina melanostoma, *Swains.*
Bolivia.

125. BULIMUS PHLOGERUS, *d'Orb. Voy.* v. 259. t. 29. f. 6, 7. B.M.
Helix phlogera, *d'Orb.*
Bolivia.

126. BULIMUS OCTONUS, *Brug., d'Orb. Voy.* v. 260. B.M.
Helix octona, *Chemn.*
Bolivia.

127. BULIMUS BACTERIONIDES, *d'Orb. Voy.* v 260. t. 29. f. 1, 2. B.M.

Helix bacterionides, *d'Orb.*
Bolivia.

128. BULIMUS (COCHLICELLA) CLAVULUS, *d'Orb. Voy.* v. 261. B.M.

Helix clavulus, *Féruss.*
Acicula fusiformis, *Kuhl.*
Bolivia.

129. BULIMUS MICRA, *d'Orb. Voy.* v. 262. t. 41. f. 18, 19. B.M.

Helix micra, *d'Orb.*
Brazils.

130. BULIMUS MIMOSARUM, *d'Orb. Voy.* v. 262. t. 41. f. 12-14. B.M.

Helix mimosarum, *d'Orb.*
Bolivia.

131. BULIMUS CAMBA, *d'Orb. Voy.* v. 263. t. 41. f. 15, 16. B.M.
Bolivia.

132. BULIMUS SCABIOSUS, *d'Orb. Voy.* v. 263.

Bulinus scabiosus, *Sow.*
Helix scabiosa, *d'Orb.*
Bolivia; Mountains of Cobija.

133. BULIMUS LICHENORUM, *d'Orb. Voy.* v. 264. t. 41. f. 9, 10. B.M.

Helix lichenorum, *d'Orb.*
Bolivia; Plains near Cobija.

134. BULIMUS UNDATUS, *Brug., d'Orb. Voy.* v. 264. B.M.

Buccinum zebra, *Müller.*
Bulla zebra, *Gmelin.*
Helix undata, *Féruss.*
Bulinus princeps, *Brod.*
Achatina pulchella, *Spix.*
Brazils; Peru; Columbia.

135. BULIMUS GALLINA SULTANA, *Lamk., d'Orb. Voy.* v. 265. B.M.
Helix gallina sultana, *Chemn.*
Helix sultana, *Dillw.*
Achatina Pavonina, *Spix.*
Bolivia.

136. BULIMUS BRODERIPI, *d'Orb. Voy.* v. 266. B.M.
Bulinus Broderipi, *Sow.*
Helix Broderipi, *d'Orb.*
Bolivia.

137. BULIMUS COTURNIX, *d'Orb. Voy.* v. 266. B.M.
Bulinus coturnix, *Brod.*
Helix coturnix, *d'Orb.*
Chili.

138. BULIMUS COQUIMBENSIS, *d'Orb. Voy.* v. 267. B.M.
Bulinus Coquimbensis, *Brod.*
Helix Coquimbensis, *d'Orb.*
Coquimbo.

139. BULIMUS PERUVIANUS, *Brug., d'Orb. Voy.* v. 267. B.M.
Helix Peruviana, *Féruss.*
Bulimus Gravesii, *King.*
Bulimus corrugatus, *King.*
Chili.

140. BULIMUS CHILENSIS, *Lesson, d'Orb. Voy.* v. 267. t. 29. f. 9, 10. B.M.
Achatina Chilensis, *Lesson.*
Bulinus granulosus, *Brod.*
Helix granulosa, *d'Orb.*
Chili.

141. BULIMUS LITA, *d'Orb. Voy.* v. 268. B.M.
Helix lita, *Féruss.*
Bulimus litturatus, *Spix.*
Brazils.

142. BULIMUS PŒCILUS, *d'Orb. Voy.* v. 268. t. 31. f. 1–10. B.M.
Helix pœcila, *d'Orb.*
Bolivia.

143. BULIMUS OREADES, *d'Orb. Voy.* v. 270. t. 31. f. 11, 12. B.M.
Helix Oreades, *d'Orb.*

144. BULIMUS SPORADICUS, *d'Orb. Voy.* v. 271. t. 32. f. 12–15. B.M.
Helix sporadica, *d'Orb.*
Patagonia; Bolivia.

145. BULIMUS TENUISSIMUS, *d'Orb. Voy.* v. 272. B.M.
Helix tenuissima, *Féruss.*
Brazils.

146. BULIMUS HELOICUS, *d'Orb. Voy.* v. 272. t. 30. f. 9–11. B.M.
Helix heloica, *d'Orb.*
Bolivia.

147. BULIMUS FOURMIERSI, *d'Orb. Voy.* v. 273. t. 30. f. 12–14. B.M.
Corrientes.

148. BULIMUS FONTAINII, *d'Orb. Voy.* v. 273. B.M.
Guayaquil.

149. BULIMUS TURRITELLA, *d'Orb. Voy.* v. 274. t. 33. f. 12–14. B.M.
Helix turritella, *d'Orb.*
Bolivia.

150. BULIMUS MONTIVAGUS, *d'Orb. Voy.* v. 275. t. 34. f. 1–3. B.M.
Helix montivaga, *d'Orb.*
Argentine Republic.

151. BULIMUS CREPUNDIA, *d'Orb. Voy.* v. 275. t. 33. f. 18, 19. B.M.
Helix crepundia, *d'Orb.*
Bolivia.

152. BULIMUS RIVASII, *d'Orb. Voy.* v. 276. t. 34. f. 8–10. B.M.
Bolivia.

153. BULIMUS TRICHODES, *d'Orb. Voy.* v. 277. t. 33. f. 1–5. B.M.
Helix trichodes, *d'Orb.*
Bolivia.

154. BULIMUS ROCAYANUS, *d'Orb. Voy.* v. 277. t. 33. f. 6, 7. B.M.
Helix Rocayana, *d'Orb.*
Bolivia.

155. BULIMUS MUNSTERII, *d'Orb. Voy.* v. 278. B.M.
Helix Camba, *d'Orb. Voy.* t. 34. f. 4–7.
Bolivia.

156. BULIMUS APODEMETES, *d'Orb. Voy.* v. 279. t. 30. f. 5–8. B.M.
Helix apodemetes, *d'Orb.*
Santa Fé.

157. BULIMUS ALBUS, *d'Orb. Voy.* v. 280. B.M.
Bulinus albus, *Brod.*
Bulimus olorinus, *Duclos.*
Chili.

158. BULIMUS CONSPERSUS, *d'Orb. Voy.* v. 280. B.M.
Bulinus conspersus, *Sow.*
Helix conspersa, *d'Orb.*
Lima; Peru.

159. BULIMUS SORDIDUS, *d'Orb. Voy.* v. 281. B.M.
Helix sordida, *Lesson.*
Bulinus striatulus, *Sow.*
Helix sordida, *d'Orb.*
Lima.

160. BULIMUS LORENZII, *d'Orb. Voy.* v. 281. B.M.
Bulinus Lorenzii, *Sow.*
Helix Lorenzii, *d'Orb.*
Lima.

161. BULIMUS SCALARIFORMIS, *d'Orb. Voy.* v. 282. B.M.
Bulinus scalariformis, *Brod.*
Helix scalariformis, *d'Orb.*
Lima.

162. BULIMUS SCUTULATUS, *d'Orb. Voy.* v. 282. B.M.
Bulinus scutulatus, *Brod.*
Helix scutulata, *d'Orb.*

163. BULIMUS HENNAHI, *Gray, d'Orb. Spic.* v. 283. t. 30. f. 3, 4. B.M.
Bulinus vittatus, *Brod.*
Helix cactorum, *d'Orb.*
Peru.

164. BULIMUS LIMONOICUS, *d'Orb. Voy.* v. 284. t. 33. f. 15, 16. B.M.
Helix limonoica, *d'Orb.*
Bolivia.

165. BULIMUS VARIANS, *d'Orb. Voy.* v. 284. B.M.
Bulinus varians, *Brod.*
Helix varians, *d'Orb.*
Bulinus tigris et B. modestus, *Brod.*
Trujillo.

166. BULIMUS TORALLYI, *d'Orb. Voy.* v. 285. t. 32. f. 1–4. B.M.
Helix Torallyi, *d'Orb.*
Bolivia.

167. BULIMUS MONTAGNEI, *d'Orb. Voy.* v. 286. t. 32. f. 5–7. B.M.
Bolivia.

168. BULIMUS PAZIANUS, *d'Orb. Voy.* v. 286. t. 32. f. 10, 11. B.M.
Helix Paziana, *d'Orb.*
Sicasica; Yungas.

169. BULIMUS NIVALIS, *d'Orb. Voy.* v. 287. t. 32. f. 8, 9. B.M.
Helix nivalis, *d'Orb.*
Bolivia.

170. BULIMUS LITHOICUS, *d'Orb. Voy.* v. 288. t. 33. f. 10, 11. B.M.
Helix lithoica, *d'Orb.*
Bolivia.

171. BULIMUS CULMINEUS, *d'Orb. Voy.* v. 288. t. 33. f. 8, 9. B.M.
Helix culminea, *d'Orb.*
Bolivia.

172. BULIMUS POLYMORPHUS, *d'Orb. Voy.* v. 289. t. 41. f. 1–5. B.M.
Helix polymorpha, *d'Orb.*
Peru.

173. BULIMUS THAMNOICUS, *d'Orb. Voy.* v. 290. t. 37. f. 4–9. B.M.
Helix thamnoica, *d'Orb.*
Bolivia.

174. BULIMUS TUPACII, *d'Orb. Voy.* v. 292. t. 38. f. 1, 5. B.M.
Helix Tupacii, *d'Orb.*
Bolivia.

175. BULIMUS INCA, *d'Orb. Voy.* v. 292. t. 38. f. 6, 7. B.M.
Helix Inca, *d'Orb.*
Bolivia.

176. BULIMUS OROBÆNUS, *d'Orb. Voy.* v. 293.
Helix orobæna, *d'Orb.*
Bolivia.

177. BULIMUS BREPHOIDES, *d'Orb. Voy.* v. 294. t. 38. f. 8, 9. B.M.
Helix brephoides, *d'Orb.*
Peru.

178. BULIMUS TAUNAYSII, *d'Orb. Voy.* v. 294. B.M.
Helix Taunaysii, *Féruss.*
Rio de Janeiro.

179. BULIMUS PHASIANELLUS, *Val., d'Orb. Voy.* v. 295. B.M.
Helix phasianella, *Féruss.*
Bulinus iostomus, *Brod.*

180. BULIMUS ONÇA, *d'Orb. Voy.* v. 295. t. 30. f. 1, 2. B.M.
Helix onça, *d'Orb.*
Bolivia.

181. BULIMUS PINTADINUS, *d'Orb. Voy.* v. 296. t. 29. f. 11, 12.
Helix pintadina, *d'Orb.*
Bolivia.

182. BULIMUS OBLONGUS, *Brug., d'Orb. Voy.* v. 297. t. 37. f. 1–3. B.M.
Helix oblonga, *Müller.*
Bulla oblonga, *Chemn.*
Bulinus hæmastomus, *Scop.*
Turbo hæmastoma, *Gmel.*
Helix ovipara, *Solander.*
Brazils.

183. BULIMUS OVATUS, *Brug., d'Orb. Voy.* v. 299. B.M.
Helix ovata, *Müller.*
Bulla ovata, *Chemn.*
Helix ovalis, *Gmelin.*
Brazils.

184. BULIMUS CANTAGALLANUS, *d'Orb. Voy.* v. 300. B.M.
Helix cantagallanus, *Rang.*
Brazils.

185. BULIMUS KREMNOICUS, *d'Orb. Voy.* v. 300. t. 35. f. 1–3. B.M.

Helix Kremnoicus, *d'Orb.*
Bolivia.

186. BULIMUS SANTA-CRUZII, *d'Orb. Voy.* v. 302. t. 36. f. 1, 2. B.M.

Helix Santa-Cruzii, *d'Orb.*
Bolivia.

187. BULIMUS LACUNOSUS, *d'Orb. Voy.* v. 302. t. 36. f. 5, 6. B.M.

Helix lacunosa, *d'Orb.*
Bolivia.

188. BULIMUS MATHIUSII, *d'Orb. Voy.* v. 303. t. 36. f. 3, 4. B.M.

Helix Mathiusii, *d'Orb.*
Peru.

189. BULIMUS ROSACEUS, *d'Orb. Voy.* v. 304. t. 34. f. 11, 12. B.M.

Bulinus rosaceus, *King.*
Bulinus Chilensis, *Sow.*
Helix rosacea, *d'Orb.*
Chili.

190. BULIMUS NUCLEUS, *d'Orb. Voy.* v. 305. B.M.

Bulinus nucleus, *Sow.*
Helix nucleus, *d'Orb.*
Bahia Blanca.

191. BULIMUS DERELICTUS, *d'Orb. Voy.* v. 306. B.M.

Bulinus derelictus, *Brod.*
Helix derelicta, *d'Orb.*
Bolivia.

192. BULIMUS PROTEUS, *d'Orb. Voy.* v. 307. B.M.

Bulinus Proteus, *Brod.*
Bulinus versicolor, *Brod.*
Helix Proteus et H. versicolor, *d'Orb.*
Peru.

193. BULIMUS CORA, *d'Orb. Voy.* v. 307. t. 34. f. 14, 15. B.M.
Helix Cora, *d'Orb.*
Peru.

194. BULIMUS ABYSSORUM, *d'Orb. Voy.* v. 308. t. 39. f. 7, 8. B.M.
Helix abyssorum, *d'Orb.*
Bolivia.

195. BULIMUS BOLIVARII, *d'Orb. Voy.* v. 309. t. 39. f. 5, 6.
Helix Bolivarii, *d'Orb.*
Bolivia.

196. BULIMUS BRACHYSOMA, *d'Orb. Voy.* v. 309. t. 39. f. 9, 10.
Helix brachysoma, *d'Orb.*
Bolivia.

197. BULIMUS MARMARINUS, *d'Orb. Voy.* v. 310. t. 39. f. 11, 12. B.M.
Helix marmarina, *d'Orb.*
Bolivia.

198. BULIMUS HYGROHYLÆUS, *d'Orb. Voy.* v. 311. t. 40. f. 3–5. B.M.
Helix hygrohylæus, *d'Orb.*
Bolivia.

199. BULIMUS XANTHOSTOMA, *d'Orb. Voy.* v. 312. t. 40. f. 1, 2.
Helix xanthostoma, *d'Orb.*
Bolivia.

200. BULIMUS AURIS LEPORIS, *Brug., d'Orb. Voy.* v. 313. B.M.
Helix auris leporis, *Féruss.*
Auricula leporis, *Lamk.*
Stenostoma auritum, *Spix.*
Brazils; Bahia.

201. BULIMUS ZOOGRAPHICUS, *d'Orb. Voy.* v. 313. t. 40. f. 6-8. B.M.
Helix zoographica, *d'Orb.*
Bolivia.

202. BULIMUS LINOSTOMA, *d'Orb. Voy.* v. 314. t. 40. f. 9-11. B.M.
Helix linostoma, *d'Orb.*
Bolivia.

203. BULIMUS FUSOIDES, *d'Orb. Voy.* v. 315. t. 40. f. 12, 13. B.M.
Helix fusoides, *d'Orb.*
Bolivia.

204. BULIMUS YUNGASENSIS, *d'Orb. Voy.* v. 316. t. 40. f. 8. B.M.
Bolivia.

205. BULIMUS LOPHOICUS, *d'Orb. Voy.* v. 316. t. 40. f. 14, 15. B.M.
Helix lophoica, *d'Orb.*
Bolivia.

206. BULIMUS RHODINOSTOMA, *d'Orb. Voy.* v. 317. t. 41. f. 6-8. B.M.
Helix rhodinostoma, *d'Orb.*
Rio Janeiro.

207. BULIMUS (COCHLODONTA) GUARANI, *d'Orb. Voy.* v. 318. t. 41 *bis*, f. 1. B.M.
Helix Guarani, *d'Orb.*
Argentine Republic.

208. BULIMUS FUSCA GULA, *d'Orb. Voy.* v. 318. t. 39. f. 1, 2 (jun.). B.M.
Auricula fusca gula, *Lea.*
Brazils.

209. BULIMUS ALVAREZII, *d'Orb. Voy.* v. 319.
Helix Alvarezii, *d'Orb.*
Argentine Republic (dead only).

210. PUPA SPIXII, *d'Orb. Voy.* v. 320. t. 41 *bis*, f. 11. B.M.
Clausilia striata, *Spix.*
Pupa striata, *Wagner.*
Helix Spixii, *d'Orb.*
Bolivia.

211. PUPA ELATIOR, *Spix, d'Orb. Voy.* v. 320. B.M.
Helix elatior, *d'Orb.*
Brazils.

212. PUPA SOWERBIANA, *d'Orb. Voy.* v. 321. t. 41 *bis*, f. 15, 16. B.M.
Helix Sowerbiana, *Féruss.*
Var. Patagonica, *d'Orb. Voy.* v. 321. f. 17, 18. B.M.
Helix Patagonica, *d'Orb.*
La Plata. *Var.* Patagonia.

213. PUPA PAREDESII, *d'Orb, Voy.* v. 322. t. 41. f. 3, 6. B.M.
Helix Paredesii, *d'Orb.*
Bolivia.

214. PUPA NODOSARIA, *d'Orb. Voy.* v. 322. t. 41 *bis*, f. 12-14.
Helix nodosaria, *d'Orb.*
Bolivia.

215. PUPA MILIOLA, *d'Orb. Voy.* v. 323. B.M.
Helix miliola, *d'Orb.*
Brazils.

216. PUPA INFUNDIBULIFORMIS, *d'Orb. Voy.* v. 323. t. 41 *bis*, f. 7, 9. B.M.
Helix infundibuliformis, *d'Orb.*
Bolivia.

Fam. 3. AURICULÆ.

217. AURICULA STAGNALIS, *d'Orb. Voy.* v. 325. t. 42. f. 7, 8. B.M.
Guayaquil, in marshes.

218. AURICULA ACUTA, *d'Orb. Voy.* v. 326. t. 42. f. 4-6. B.M.
Guayaquil.

219. AURICULA REFLEXILABRIS, *d'Orb. Voy.* v. 326. t. 42. f. 1-3. B.M.
Auricula myosotis, *d'Orb.*
Lima; Peru.

220. AURICULA (CONOVULUS) GLOBULUS, *d'Orb. Voy.* v. 327. B.M.
Guayaquil.

Suborder II. HYDROPHILES (PULMONES AQUATIQUES).

221. CHILINA DOMBEIANA, *d'Orb. Voy.* v. 333. B.M.
Bulinus Dombeyanus, *Brug.*
Conovulus bulimoides, *Lamk.*
Auricula Dombeyana, *Lamk.*
Auricula fluviatilis, *Lesson.*
Limneus Dombeyanus, *d'Orb.*
Chili.

222. CHILINA FLUCTUOSA, *d'Orb. Voy.* v. 334. t. 43. f. 13-16. B.M.
Otis fluctuosa, *Humph.*
Auricula (Chilina) fluctuosa, *Gray.*
Chili.

223. CHILINA BULLOIDES, *d'Orb. Voy.* v. 335. t. 43. f. 18. B.M.
Limneus bulloides, *d'Orb.*
Chiloe; Chili.

224. CHILINA TEHUELCHA, *d'Orb. Voy.* v. 336. t. 43. f. 6, 7. B.M.
Patagonia.

225. CHILINA PUELCHA, *d'Orb. Voy.* v. 336. t. 43. f. 8-12. B.M.
Patagonia.

226. CHILINA FLUMINEA, *d'Orb. Voy.* v. 337. t. 43. f. 19, 20. B.M.

Voluta fluminea et Vol. fluvialis, *Maton.*
Limneus flumineus, *d'Orb.*

Patagonia.

227. CHILINA PARCHAPPII, *d'Orb. Voy.* v. 338. t. 43. f. 4, 5. B.M.

Limneus Parchappii, *d'Orb.*

Argentine Republic; Arroya Salado; Southern Pampas.

This genus may be divided into three groups:—I. Inner lip thin; pillar-fold indistinct: *C. Parchappii.* II. Inner lip moderate; pillar-fold distinct: *C. Dombeiana, C. fluctuosa, C. bulloides, C. Tehuelcha, C. Puelcha.* III. Inner lip thickened; pillar with three or four large plaits: *C. fluminea.*

228. LIMNÆUS VIATOR, *d'Orb. Voy.* v. 340. t. 43. f. 1–3. B.M.

Patagonia.

229. PHYSA RIVALIS, *d'Orb. Voy.* v. 341. B.M.

Var. major, Physa Peruviana, *Gray.* B.M.

Brazils.

230. PLANORBIS FERRUGINEUS, *Spix, d'Orb. Voy.* v. 344. B.M.

Planorbis olivaceus, *Spix.*

Brazils.

231. PLANORBIS PERUVIANUS, *Brod., d'Orb. Voy.* v. 345. B.M.

Peru.

232. PLANORBIS MONTANUS, *d'Orb. Voy.* v. 345. t. 45. f. 5–8. B.M.

Lake of Titicaca.

233. PLANORBIS ANDECOLUS, *d'Orb. Voy.* v. 346. t. 44. f. 1–4. B.M.

Lake of Titicaca.

It is probably only a variety of *P. montanus.*

234. PLANORBIS TENAGOPHILUS, *d'Orb. Voy.* v. 347. t. 44. f. 9–12. B.M.

Argentine Republic.

235. PLANORBIS PEREGRINUS, *d'Orb. Voy.* v. 348. t. 44. f. 13–16. B.M.

Patagonia; Laguna de la Cruz; Bolivia; Guayaquil; Montevideo.

236. PLANORBIS HELOICUS, *d'Orb. Voy.* v. 349. t. 45. f. 9–12. B.M.

Republic of Uruguay.

237. PLANORBIS HELOPHILUS, *d'Orb. Voy.* v. 349. t. 45. f. 13–16. B.M.

Peru.

238. PLANORBIS KERMATOIDES, *d'Orb. Voy.* v. 350. t. 45. f. 1–4. B.M.

Peru.

239. PLANORBIS PAROPSEIDES, *d'Orb. Voy.* v. 350. t. 45. f. 5–8. B.M.

Peru.

240. PLANORBIS ANATINUS, *d'Orb. Voy.* v. 351. t. 45. f. 17–20. B.M.

Rio Parana.

241. ANCYLUS CONCENTRICUS, *d'Orb. Voy.* v. 354. t. 42. f. 18–21. B.M.

Montevideo.

242. ANCYLUS MORICANDI, *d'Orb. Voy.* v. 355

Parana.

243. ANCYLUS CULICOIDES, *d'Orb. Voy.* v. 355. t. 42. f. 9–12. B.M.

Guayaquil.

A. concentricus and *A. culicoides* are sinistrorse, belonging to the genus *Veletia*. *A. Gayanus* is a true *Ancylus*.

244. ANCYLUS GAYANUS, *d'Orb. Voy.* v. 356. t. 42. f. 13–17. B.M.

Ancylus radiatus, *d'Orb.*

Valparaiso.

Suborder III. PULMONES OPERCULES.

245. HELICINA FULVA, *d'Orb. Voy.* v. 358. t. 46. f. 1–5. B.M.
Bolivia.

246. HELICINA ORESIGENA, *d'Orb. Voy.* v. 359. t. 46. f. 10–16. B.M.
Bolivia.

247. HELICINA SYLVATICA, *d'Orb. Voy.* v. 359. t. 46. f. 17–20. B.M.
Bolivia.

248. HELICINA CARINATA, *d'Orb. Voy.* v. 360. t. 46. f. 6–9.
Bolivia.

249. CYCLOSTOMA INCA, *d'Orb. Voy.* v. 361. t. 46. f. 21–23. B.M
Bolivia; St. Cruz.

250. CYCLOSTOMA PROMINULA, *Féruss, d'Orb. Voy.* v. 362.
Brazils.

251. CERATODES CORNU ARIETIS, *d'Orb. Voy.* v. 366. t. 48. f. 7–9. B.M.
Helix cornu arietis, *Born.*
Planorbis contrarius, *Müller.*
Planorbis cornu arietis, *Lamk.*
Ampullaria cornu arietis, *Gray.*
Ceratodes fasciata, *Guild.*
Columbia; Parana; Entre Rios.

252. CERATODES CHIQUITENSIS, *d'Orb. Voy.* v. 367. t. 48. f. 10, 11. B.M.
Ceratodes cornu arietis, *d'Orb. MSS. Brit. Mus.*
Bolivia; Chiquitos.

This species is *Marisa intermedia*, Gray, Ann. Philos. lxiii. 273, 1824.

253. AMPULLARIA NERITOIDES, *d'Orb. Voy.* v. 368. t. 49. f. 1, 2. B.M.

Rio Uruguay.

254. AMPULLARIA SCALARIS, *d'Orb. Voy.* v. 369. t. 50. f. 1-3. B.M.

Rio Parana; Entre Rios.
Var. *c.* Bolivia; St. Cruz.

255. AMPULLARIA INTERMEDIA, *Féruss., d'Orb. Voy.* v. 371. B.M

Ampullaria sordida, *Swains.*
Brazils; Rio de Janeiro.

256. AMPULLARIA CANALICULATA, *Lamk., d'Orb. Voy.* v. 371. t. 5. f. 4-6 & t. 49. f. 7. B.M

Ampullaria gigas, *Spix.*
Ampullaria lineata et A. figulina, *Wagner.*
Brazils.

257. AMPULLARIA INSULARUM, *d'Orb. Voy.* v. 374. t. 51. f. 1, 2. B.M.

Rio Uruguay.

258. AMPULLARIA AUSTRALIS, *d'Orb. Voy.* v. 375. t. 51. f. 3, 4. B.M.

Buenos Ayres; Las Pampas.

259. AMPULLARIA SPIXII, *d'Orb. Voy.* v. 376. t. 52. f. 7, 8. B.M.

Ampullaria zonata, *d'Orb.*
Corrientes.

Deeply umbilicated; operculum horny; nucleus subcentral, rather in the inner side of the middle. Nearly allied to *Ceratodes.*

260. AMPULLARIA ROISSYI, *d'Orb. Voy.* v. 377. t. 52. f. 1-3. B.M.

Ampullaria crassa, *d'Orb.*
Corrientes.

261. AMPULLARIA ELEGANS, *d'Orb. Voy.* v. 378. t. 52. f. 46. B.M.

Ampullaria peristomata, *d'Orb.*

Bolivia; Parana; Entre Rios.

A. elegans and *A. Roissyi* are nearly allied to *A. Spixii*, but differ only in being perforated; but the size of the perforation varies greatly in the specimens of these species, and the three pass very gradually into each other; they differ from the other South American species of the genus in being thicker and more strongly banded, with a thinner periostraca.

262. AMPULLOIDEA PLATÆ, *d'Orb. Voy.* v. 379. t. 49. f. 3–6. B.M.

Helix Platæ, *Maton.*

Ampulloidea naticoides, *d'Orb.*

Asolene Platæ, *d'Orb.*

Buenos Ayres.

The *Ampullariadæ* with horny opercula, as *Ceratodes* and *Pomus* and *Lanistes*, have an elongated siphon, while those which have a shelly operculum, as *Ampullaria* and *Ampulloidea*, are without any appearance of that organ; this is also the case in the Indian species. See Mrs. Gray's "Figures of Mollusca," for the animals of this family.

Order V. PECTINIBRANCHIA.

Fam. 3. LITTORINIDÆ.

263. PALUDESTRINA PERISTOMATA, *d'Orb. Voy.* v. 382. t. 47. f. 1–3. B.M.

Paludina peristomata, *d'Orb.*

Parana; Corrientes.

264. PALUDESTRINA LAPIDUM, *d'Orb. Voy.* v. 382. t. 47. f. 4–9. B.M.

Paludina lapidum, *d'Orb.*

Parana.

P. peristomata, *P. lapidum* and *P. Petitiana* are very nearly allied, if not the same species, and are distinguished from the other species of the genus by their short conic shape and dark green periostraca and oblique aperture.

265. PALUDESTRINA PISCIUM, *d'Orb. Voy.* v. 383. t. 47. f. 17–21. B.M.
Paludina piscium, *d'Orb.*
La Plata.

266. PALUDESTRINA PARCHAPPII, *d'Orb. Voy.* v. 383. t. 48. f. 1–3. B.M.
Paludina Parchappii, *d'Orb.*
Buenos Ayres.

267. PALUDESTRINA AUSTRALIS, *d'Orb. Voy.* v. 384. t. 48. f. 4–6. B.M.
Paludina australis, *d'Orb.*
Patagonia.

268. PALUDESTRINA CHARRUANA, *d'Orb. Voy.* v. 384. t. 75. f. 1–2. B.M.
Montevideo.

269. PALUDESTRINA ISABELLEANA, *d'Orb. Voy.* v. 385. t. 75. f. 4–6. B.M.
Montevideo.

270. PALUDESTRINA CUMINGII, *d'Orb. Voy.* v. 385. t. 47. f. 14–16. B.M.
Paludina Cumingii, *d'Orb.*
Callao; Chili.

271. PALUDESTRINA ANDECOLA, *d'Orb. Voy.* v. 385. t. 47. f. 13. B.M.
Paludina andecola, *d'Orb.*
Lake of Titicaca.

272. PALUDESTRINA CULMINEA, *d'Orb. Voy.* v. 386. t. 47. f. 17, 21. B.M.
Lake of Titicaca.

273. PALUDESTRINA STRIATA, *d'Orb. Voy.* v. 386. t. 75. f. 7–9. B.M.
Patagonia; Falkland Islands.

274. PALUDESTRINA SEMISTRIATA, *d'Orb. Voy.* v. 386. t. 75. f. 10–12. B.M.
Patagonia; Falkland Islands.

275. PALUDESTRINA FUSCA, *d'Orb. Voy.* v. 387. t. 75. f. 13–15. B.M.
Arica; Peru.

276. PALUDESTRINA NIGRA, *d'Orb. Voy.* v. 387. t. 75. f. 16–18. B.M.
Arica; Peru.

277. PALUDESTRINA PETITIANA, *d'Orb. Voy.* v. 387. t. 75. f. 19–21. B.M.
Parana.
Allied to *P. peristomata.*

278. TURRITELLA CINGULATA, *Sow., d'Orb. Voy.* v. 388. B.M.
Turritella tricarinata, *King.*
Chili.

279. TURRITELLA BRODERIPIANA, *d'Orb. Voy.* v. 388. B.M.
Turritella Californica, *Brod.* (!) ? young.
Peru; Payta.

280. SCALARIA ELEGANS, *d'Orb. Voy.* v. 389. t. 54. f. 1, 2, 3. B.M.
Patagonia.

281. SCALARIA TENUISTRIATA, *d'Orb. Voy.* v. 390. t. 54. f. 4–6. B.M.
Bahia Blanca.

282. SCALARIA BREVIS, *d'Orb. Voy.* v. 390. t. 75. f. 22–24. B.M.
Falkland Islands.

283. LITTORINA FLAVA, *Brod., d'Orb. Voy.* v. 391. t. 53. f. 1–3. B.M.
Rio Janeiro.

284. LITTORINA COLUMELLARIS, *d'Orb. Voy.* v. 392. B.M.
Pernambuco.
L. columellaris appears to be a variety of *L. flava.*

285. LITTORINA LINEOLATA, *d'Orb. Voy.* v. 392. B.M.
Trochus zigzag, *Chemn.*
Rio Janeiro.

286. LITTORINA PERUVIANA, *d'Orb. Voy.* v. 393. t. 53. f. 5, 6, 7. B.M.
Phasianella Peruviana, *Lamk.*
Turbo zebra, *Gray.*
Chili; Peru.

287. LITTORINA ARAUCANA, *d'Orb. Voy.* v. 393. t. 53. f. 8, 9, 10. B.M.
Chili.

288. LITTORINA UMBILICATA, *d'Orb. Voy.* v. 394. t. 76. f. 1–3. B.M.
Peru; Bolivia.

289. RISSOINA INCA, *d'Orb. Voy.* v. 395. t. 53. f. 11–16. B.M.
Peru; Bolivia.

Fam. 4. PYRAMIDELLIDÆ.

290. CHEMNITZIA TURRIS, *d'Orb. Voy.* v. 396. B.M.
Rio Janeiro.

291. CHEMNITZIA AMERICANA, *d'Orb. Voy.* v. 397. t. 53. f. 17–19. B.M.
Patagonia.

292. CHEMNITZIA FASCIATA, *d'Orb. Voy.* v. 397. t. 76. f. 4–6. B.M.
Brazils.

293. CHEMNITZIA DUBIA, *d'Orb. Voy.* v. 398.
Brazils.

294. CHEMNITZIA CORA, *d'Orb. Voy.* v. 398. t. 76. f. 7–9. B.M.

Peru.

295. TORNATELLA VENUSTA, *d'Orb. Voy.* v. 399. t. 56. f. 4–6. B.M.

Peru.

Fam. 5. NATICIDÆ.

296. NATICA CANRENA, *Lamk., d'Orb. Voy.* v. 400. B.M.

Nerita canrena, *Linn.*

Brazils.

297. NATICA UBER, *Valenc., d'Orb. Voy.* v. 401. t. 55. f. 12–14. B.M.

Peru; Callao.

Operculum horny.

298. NATICA CORA, *d'Orb. Voy.* v. 401. t. 76. f. 10, 11. B.M.

Peru; Callao.

Operculum horny.

299. NATICA LIMBATA, *d'Orb. Voy.* v. 402. t. 57. f. 7–9. B.M.

Patagonia.

Operculum horny, with a very thin smooth shelly outer layer.

300. NATICA ISABELLEANA, *d'Orb. Voy.* v. 402. t. 76. f. 12, 13. B.M.

Maldonado.

Very like *N. limbata*, but with the spire rather more produced, and suture deeper; operculum wanting.

301. NATICA GLAUCA, *Valenc., d'Orb. Voy.* v. 403. B.M.

Natica patula, *Sow.*

Peru; Payta.

Operculum horny.

302. SIGARETUS CYMBA, *Menke, d'Orb. Voy.* v. 404. t. 57. f. 3–6. B.M.
Sigaretus concavus, *Sow.*
Peru.

Fam. 6. NERITIDÆ.

303. NERITINA MELEAGRIS, *Lamk., d'Orb. Voy.* v. 405. t. 56. f. 1–3. B.M.
Brazils.

304. NERITINA VIRGINEA, *Lamk., d'Orb. Voy.* v. 406. B.M.
Nerita virginea, *Linn.*
Brazils.

305. NERITINA FONTAINEANA, *d'Orb. Voy.* v. 406. t. 76. f. 14, 15. B.M.
Rio de Guayaquil.

Fam. 7. TROCHIDÆ.

306. TROCHUS ARTICULATUS, *Gray, d'Orb. Voy.* v. 407. B.M.
Brazils.

307. TROCHUS PATAGONICUS, *d'Orb. Voy.* v. 408. t. 55. f. 1–4. B.M.
Patagonia.

308. TROCHUS QUADRICOSTATUS, *Gray, d'Orb. Voy.* v. 408. B.M.
Chili.

309. TROCHUS ATER, *Lesson, d'Orb. Voy.* v. 409. B.M.
Chili.

310. TROCHUS LUCTUOSUS, *d'Orb. Voy.* v. 409. t. 76. f. 16–19. B.M.
Peru; Chili.

T. luctuosus is only an umbilicated variety of *T. ater*. It is often strongly keeled.

311. TROCHUS MICROSTOMUS, *d'Orb. Voy.* v. 410. t. 76. f. 20, 21. B.M.

Chili.

312. TROCHUS ARAUCANUS, *d'Orb. Voy.* v. 410. t. 55. f. 5-8. B.M.

Chili.

313. TROCHUS MALOUINUS, *d'Orb. Voy.* v. 411. B.M.

Falkland Islands.

A species of *Margarita*.

314. DELPHINULA CANCELLANA, *Gray, d'Orb. Voy.* v. 411. B.M.

Arica.

315. TURBO NIGER, *Gray, d'Orb. Voy.* v. 411. t. 55. f. 9-11. B.M.

Chili.

Fam. 8. IANTHINIDÆ.

316. IANTHINA FRAGILIS, *Lamk., d'Orb. Voy.* v. 413. t. 61. f. 8-10. B.M.

Helix Ianthina, *Linn.*
Trochus Ianthina, *Chemn.*
Ianthina peniccphala, *Peron.*
Ianthina communis, *Lamk.*
Ianthina bicolor, *Costa.*

Atlantic Ocean.

317. IANTHINA PROLONGATA, *Blainv., d'Orb. Voy.* v. 414. B.M.

Ianthina globosa, *Swainson.*
Ianthina communis, *Costa.*
Ianthina nitens, *Menke.*

Atlantic Ocean.

These shells are almost always found in company with each other: can they be different sexes of the same species?

318. IANTHINA EXIGUA, *Lamk., d'Orb. Voy.* v. 414. B.M.
Atlantic Ocean.

319. IANTHINA UMBILICATA, *d'Orb. Voy.* v. 414. B.M.
Atlantic Ocean.

Fam. 9. CYPREADÆ.

320. CYPRÆA NIGRO-PUNCTATA, *Gray, d'Orb. Voy.* v. 415. B.M.
Payta.

321. MARGINELLA BULLATA, *Lamk., d'Orb. Voy.* v. 415. B.M.
Voluta bullata, *Born.*
Voluta ovum, *Gmelin.*
Marginella Belangeri, *Kiener.*
Brazils; Bahia.

322. MARGINELLA CURTA, *Sow., d'Orb. Voy.* v. 416. B.M.
Peru; Payta.

Fam. 10. OLIVIDÆ.

323. OLIVINA PUELCHANA, *d'Orb. Voy.* v. 418. t. 9. f. 13–19. B.M.
Oliva Puelchana, *Duclos.*
Patagonia.

324. OLIVINA TEHUELCHANA, *d'Orb. Voy.* v. 418. t. 59. f. 7–12. B.M.
Oliva Tehuelchana, *Duclos.*
Patagonia.

325. OLIVINA COLUMELLARIS, *d'Orb. Voy.* v. 419. B.M.
Oliva columellaris, *Sow.*
Peru; Payta.
Operculum horny, thin.

326. OLIVA PERUVIANA, *Lamk.*, *d'Orb. Voy.* v. 419. B.M.
Peru; Arica.

327. OLIVANCILLARIA BRASILIENSIS, *d'Orb. Voy.* v. 420. B.M.
Oliva Brasiliensis, *Chemn.*
Brazils.

328. OLIVANCILLARIA AURICULARIA, *d'Orb. Voy.* v. 421. t. 59. f. 20-22. B.M.
Oliva auricularia, *Lamk.*
Patagonia.
β. Shell very short, broad.

Fam. 11. STROMBIDÆ.

329. STROMBUS PUGILIS, *Linn.*, *d'Orb. Voy.* v. 421. B.M.
Brazils.

Fam. 12. VOLUTIDÆ.

330. VOLUTELLA ANGULATA, *d'Orb. Voy.* v. 423. t. 60. f. 1–3. B.M.
Voluta angulata, *Swains.*
Patagonia.
The subangulation sometimes very indistinct.

331. VOLUTA BRASILIANA, *Solander*, *d'Orb. Voy.* v. 424. t. 6. f. 4–6. B.M.
Voluta Colocynthis, *Chemn.*
Patagonia.

332. VOLUTA MAGELLANICA, *Chemn.*, *d'Orb. Voy.* v. 425. B.M.
Patagonia.

333. VOLUTA ANCILLA, *Solander*, *d'Orb. Voy.* v. 425. B.M.
Voluta Magellanica et V. spectabilis, *Gmelin.*
Voluta gracilis, *Wood.*
Patagonia; Maghellan Straits.

334. VOLUTA FESTIVA, *Lamk., d'Orb. Voy.* v. 426. B.M.
Patagonia to Magellan Straits.
This is *Voluta Beckii,* Brod.

335. VOLUTA TUBERCULATA, *Gray, d'Orb. Voy.* v. 426. B.M.
Patagonia to Magellan Straits.

Voluta Magellanica, V. festiva and *V. tuberculata* appear to be varieties of the same species, differing in the nodulousness of the whorls and the length of the spire. They differ from *V. ancilla* in being shorter and more ventricose and of a thicker consistence. The younger specimens of *V. ancilla* are generally rather thin, but sometimes the older ones are very heavy and solid. *V. Beckii,* Broderip, is only a large specimen of *V. festiva* of d'Orbigny: there is a specimen of the same size in the collection from Patagonia. This species is nearly as large as *V. magnifica,* and like it an inhabitant of the colder regions.

336. MITRA MAURA, *Brod., d'Orb. Voy.* v. 427. t. 6. f. 9, 10. B.M.
Arica.

337. MITRA INCA, *d'Orb. Voy.* v. 427. t. 77. f. 1. B.M.
Peru; Payta.

338. CANCELLARIA TUBERCULOSA, *Sow., d'Orb. Voy.* v. 427. t. 60. f. 11. B.M.
Peru.

339. CANCELLARIA CASSIDIFORMIS, *Sow., d'Orb. Voy.* v. 428. B.M.
Peru; Payta.

340. CANCELLARIA BUCCINOIDES, *Sow., d'Orb. Voy.* v. 428. B.M.
Callao.

341. CANCELLARIA CHRYSOSTOMA, *Sow., d'Orb. Voy.* v. 425. B.M.
Peru; Payta.

Fam. 13. BUCCINIDÆ.

342. COLUMBELLA STROMBIFORMIS, *Lamk.*, *d'Orb. Voy.* v. 429.

Peru; Payta.

343. COLUMBELLA PAYTANSIS, *Lesson*, *d'Orb. Voy.* v. 429. B.M.

Columbella spurca, *Sow.*

Peru; Payta.

Periostraca thick, lamellar, velvety.

344. COLUMBELLA MELEAGRIS, *Duclos*, *d'Orb. Voy.* v. 430. B.M.

Peru; Payta.

Periostraca thin, smooth, shining.

345. COLUMBELLA LANCEOLATA, *Sow.*, *d'Orb. Voy.* v. 430. B.M.

Peru; Payta.

346. COLUMBELLA GIBBOSULA, *Brod.*, *d'Orb. Voy.* v. 430. B.M.

Peru; Payta.

347. COLUMBELLA SORDIDA, *d'Orb. Voy.* v. 430. t. 77. f. 2–4. B.M.

Peru; Arica and Callao.

348. COLUMBELLA SERTULARIARUM, *d'Orb. Voy.* v. 431. t. 61. f. 13–17. B.M.

Patagonia; San Blas.

349. NASSA DENTIFERA, *d'Orb. Voy.* v. 432. t. 61. f. 22, 23. B.M.

Buccinum dentiferum, *Powis.*

Peru.

350. NASSA GAYI, *d'Orb. Voy.* v. 432. B.M.

Buccinum Gayi, *Kiener.*

Chili; Valparaiso.

351. NASSA POLYGONA, *d'Orb. Voy.* v. 433. B.M.
Buccinum polygonum, *Lamk.*
Brazils.

352. NASSA ISABELLEI, *d'Orb. Voy.* v. 433. t. 61. f. 18–21. B.M.
Patagonia.

353. NASSA FONTAINEI, *d'Orb. Voy.* v. 433. t. 77. f. 5, 6. B.M.
Peru; Payta.

353*. NASSA FONTAINEI, part., *d'Orb. MSS.* B.M.
Peru; Payta.

353**. NASSA ——, n. s. B.M.
Peru; Callaq.
These are most distinct species: there is a specimen of each.

354. BUCCINANOPS COCHLIDIUM, *d'Orb. Voy.* v. 434. t. 61. f. 25. B.M.

Var. 1. Without any band on the suture. B.M.
Buccinum Lamarckii, *Kiener.*
South Patagonia.

Var. 2. With a smooth band or suture. B.M.
North Patagonia.

Var. 3. With tubercular band or suture. B.M.
Patagonia.

These varieties are very distinct species. Operculum subtrigonal, ovate; apex rounded; the nucleus rather large, broad at the front part of the curved outer edge.

355. BUCCINANOPS GLOBULOSUM, *d'Orb. Voy.* v. 435. t. 61. f. 24. B.M.
Buccinum globulosum, *Kiener.*
Patagonia; Mouth of Rio Negro.
Opercula exactly like former.

356. PURPURA HÆMASTOMA, *Lamk., d'Orb. Voy.* v. 435. B.M.

Buccinum hæmastoma, *Linn.*
Brazils.

357. PURPURA CHOCOLATA, *Blainv., d'Orb. Voy.* v. 436. t. 61. f. 1–3. B.M.

Peru; Bolivia.

Young shell white, very unlike the adult.

358. PURPURA XANTHOSTOMA, *Brod., d'Orb. Voy.* v. 437. B.M.

Chili.

This is a species of *Rapana*, and exceedingly variable in thickness and form.

359. PURPURA SCALARIFORMIS, *Lamk., d'Orb. Voy.* v. 437. B.M.

Guayaquil.

360. PURPURA CONCHOLEPAS, *d'Orb. Voy.* v. 437. t. 61. f. 5–7. B.M.

Concholepas, *Chemn.*
Buccinum concholepas, *Gmelin.*
Patella lepas, *Gmelin,*
Concholepas Peruvianus, *Lamk.*
Purpura pileopsis, *Blainv.*
Peru.

361. PURPURA CASSIDIFORMIS, *Blainv., d'Orb. Voy.* v. 438. B.M.

Peru; Payta.

362. PURPURA CALLAOENSIS, *Gray* (??), *d'Orb. Voy.* v. 439. B.M.

Peru; Callao.

363. PURPURA DELESSERTIANA, *d'Orb. Voy.* v. 439. t. 77. f. 7. B.M.

Peru; Payta.

364. PURPURA UNDATA, *Lamk., d'Orb. Voy.* v. 439. B.M.
Purpura bicarinata, *Kiener.*
Brazils.

365. PURPURA BICOSTALIS, *Lamk., d'Orb. Voy.* v. 439. B.M.
Brazils.

366. PURPURA JANELLI, *Kiener, d'Orb. Voy.* v. 440. B.M.
Peru; Payta.
A species of *Pusio.*

367. PURPURA FASCIOLARIS, *Lamk., d'Orb. Voy.* v. 440. B.M.
Peru; Payta.
A species of *Pusio.*

368. MONOCEROS GIGANTEUM, *Lesson, d'Orb. Voy.* v. 440. t. 77. f. 8. B.M.
Monoceros fusoides, *King.*
Chili; Concepcion.

369. MONOCEROS CRASSILABRUM, *Lamk., d'Orb. Voy.* v. 441. t. 61. f. 4. B.M.
Buccinum unicorne, *Brug.*
Monoceros citrinum et M. acuminatum, *Sow.*
Coquimbo.

370. MONOCEROS BREVIDENTATUM, *Gray, d'Orb. Voy.* v. 441.
Purpura cornigera, *Blainv.*
Peru; Payta.

371. MONOCEROS GLABRATUM, *Lamk., d'Orb. Voy.* v. 442. B.M.
Maghellan Straits; Port Famine.

372. TEREBRA PATAGONICA, *d'Orb. Voy.* v. 442. t. 62. f. 1. B.M.
Patagonia; Baiha Blanca.

373. CERITHIUM VARICOSUM, *Sow., d'Orb. Voy.* v. 443. B.M.
Guayaquil.
Operculum circular, many-whorled.

374. CERITHIUM MONTAGNEI, *d'Orb. Voy.* v. 443. t. 63. f. 3, 4. B.M.
Guayaquil.
Only a variety of *C. varicosum* without varices.

375. CERITHIUM PERUVIANUM, *d'Orb. Voy.* v. 443. t. 77. f. 9, 10. B.M.
Peru; Arica.

376. CERITHIUM GUARANIANUM, *d'Orb. Voy.* v. 443. t. 77. f. 11, 12. B.M.
Brazils.

377. CERITHIUM ATRATUM, *Brug., d'Orb. Voy.* v. 444. B.M.
Murex atratus, *Born.*
Brazils; Rio de Janeiro.

Fam. 14. CASSIDÆ.

378. CASSIS GRANULOSA, *Lamk., d'Orb. Voy.* v. 444.
Cassidea granulosa, *Brug.*
Brazils; Rio de Janeiro.

379. CASSIS TESTICULUS, *Lamk., d'Orb. Voy.* v. 445.
Buccinum testiculus, *Linn.*
Cassidea testiculus, *Brug.*
Brazils.

Fam. 15. MURICIDÆ.

380. PLEUROTOMA GUARANI, *d'Orb. Voy.* v. 445. t. 77. f. 13, 14.
Brazils.

381. PLEUROTOMA PATAGONICA, *d'Orb. Voy.* v. 446. t. 77. f. 15, 16.
Patagonia.

382. Fusus multicarinatus, *Lamk., d'Orb. Voy.* v. 446. B.M.

Brazils.

382*. Fusus ——, n. s.? *d'Orb. MSS.*

Brazils; Rio Janeiro.

Operculum ovate, acute.

383. Fusus morio, *Lamk., d'Orb. Voy.* v. 447. B.M.

Murex morio, *Linn.*
Fusus coronatus, *Lamk.*
Brazils.

384. Fusus Fontainei, *d'Orb. Voy.* v. 447. t. 63. f. 2. B.M.

Var. β. minor, *d'Orb.*
Purpura Ungaricoides, *d'Orb. MSS.*
Peru; Cobyra. β. Peru; Callao; Payta.

385. Fusus purpuroides, *d'Orb. Voy.* v. 448. t. 65. f. 1. B.M.

Purpura fusoides, *Blainv.*
Peru.

Operculum ovate, curved; apex rounded; nucleus apical.

386. Fasciolaria trapezium, *Lamk., d'Orb. Voy.* v. 448. B.M.

Murex trapezium, *Linn.*
Brazils.

387. Turbinella Brasiliana, *d'Orb. Voy.* v. 449. t. 77. f. 17. B.M.

Brazils.

388. Triton pileare, *d'Orb. Voy.* v. 449. B.M.

Murex pileare, *Linn.*
Triton succinctum, *Lamk.*
Brazils.

389. TRITON SCABER, *Brod., d'Orb. Voy.* v. 450. t. 62. f. 13. B.M.

Peru.

A very variable species. The periostraca largely hirsute, sometimes only velvet-like.

390. RANELLA VENTRICOSA, *Brod., d'Orb. Voy.* v. 451. t. 62. f. 11, 12. B.M.

Peru.

Eggs (marked "Ranella inflata, *Brod.*") small, crowded.

391. RANELLA KINGII, *d'Orb. Voy.* v. 451. B.M.

Triton ranelliformis, *King.*

Chili.

Operculum oblong, rounded at each end, with the nucleus on the front of the outer margin.

392. MUREX MAGELLANICUS, *Gmelin, d'Orb. Voy.* v. 451. B.M.

Patagonia; Maghellan Straits.

393. MUREX PATAGONICUS, *d'Orb. Voy.* v. 452. t. 62. f. 2, 3. B.M.

Patagonia.

394. MUREX VARIANS, *d'Orb. Voy.* v. 452. t. 62. f. 4–7. B.M.

Patagonia.

Murex Magellanicus, M. Patagonicus and *M. varians* are varieties of a most variable species. The lamellæ are sometimes very close, regular, crowded (*M. Magellanica*); at others few and far apart, giving an angular shape to the body whorl (*M. Patagonica*); often completely wanting, the shell being only slightly spirally striated (*M. varians*). They clearly pass into each other, and vary greatly in the thickness of the shell: those that are closely lamellar are generally thin and brittle; the older ones, without lamellæ, are thick and solid, as in our *Purpura lapillus*, showing that the absence of the lamellæ and thickness of the shell depend on the locality.

These shells also vary in the size of the cavity on the front of the axis.

395. MUREX ASPERRIMUS, *Lamk., d'Orb. Voy.* v. 452. B.M.
Murex pomum, *Gmelin.*
Brazils.

396. MUREX SIRAT, *d'Orb. Voy.* v. 453. B.M.
Purpura Sirat, *Adanson.*
Brazils.

397. MUREX LABIOSUS, *Gray, d'Orb. Voy.* v. 453. t. 62. f. 8–10. B.M.
Chili.

A species of *Rapana.* Operculum like *Purpura xanthostoma. Murex salebrosus* and *miliaris* also belong to that genus, as they have an operculum like *Purpura.*

398. MUREX BUXEUS, *Brod., d'Orb. Voy.* v. 453. B.M.
Peru.

399. MUREX HORRIDUS, *Brod., d'Orb. Voy.* v. 454. B.M.
Peru.

400. MUREX ERYTHROSTOMUS, *Swainson, d'Orb. Voy.* v. 454.
Peru; Payta.

401. MUREX MICROPHILUS, *Lamk., d'Orb. Voy.* v. 454. B.M.
Brazils; Bahia.

402. MUREX MONOCEROS, *d'Orb. Voy.* v. 454. t. 78. f. 1, 2. B.M.
Peru; Payta.

403. MUREX SQUAMOSUS, *Brod., d'Orb. Voy.* v. 455.
Peru; Payta.

404. MUREX INCA, *d'Orb. Voy.* v. 455. t. 78. f. 3. B.M.
Callao.

Operculum ovate, acute; nucleus apical.

Fam. 16. VERMETIDÆ.

405. VERMETUS VARIANS, *d'Orb. Voy.* v. 456. t. 54. f. 7–10. B.M.

Brazils.

Operculum orbicular, thin; nucleus central.

Fam. 17. CREPIDULIDÆ.

406. PILEOPSIS UNGARICOIDES, *d'Orb. Voy.* v. 457. t. 78. f. 4. B.M.

Peru; Payta.

407. CALYPTRÆA (CALYPEOPSIS) QUIRIQUINA, *d'Orb. Voy.* v. 459. B.M.

Calyptræa quiriquina, *Lesson.*

Chili; Concepcion.

408. CALYPTRÆA (CALYPEOPSIS) RUGOSA, *d'Orb. Voy.* v. 459. B.M.

Calyptræa rugosa et C. umbrella, *Desh.*
Calyptræa rudis, C. lignaria et C. tenuis, *Brod.*

Chili.

409. CALYPTRÆA (CALYPEOPSIS) IMBRICATA, *d'Orb. Voy.* v. 460. B.M.

Calyptræa imbricata, *Sow.*
Calyptræa rugosa, *Brod.*

Peru; Payta.

410. CALYPTRÆA (CALYPEOPSIS) AURICULATA, *d'Orb. Voy.* v. 461. B.M.

Patella auriculata, *Chemn.*
Calyptræa spinosa, *Wood, Brod.*
Calyptræa tubifera, *Lesson.*
Dispolia tubifera, *Say.*

Peru; Payta.

Calyptræa quiriquina, C. rugosa, C. lignaria and *C. imbricata* are varieties of the same species, differing in the smoothness or *costation* of the outer surface; some specimens which are costate when young become smooth as they increase in size and *vice*

versâ, and differ in shape according to the form of the body to which they happen to be attached. It is doubtful if *C. auriculata* is distinct from them; it is probably only a variety living in more sheltered places, where the mantle is furnished with elongated bands forming tubular sheaths on the outer surface of the shell. In all the species the *cup* in the younger specimens is attached by a considerable portion of its outer surface to the disc of the shell; in the older ones, the lower part of it is only attached to the shell by a single point.

411. CALYPTRÆA (TROCHATELLA) TROCHIFORMIS, *d'Orb. Voy.* v. 461. t. 59. f. 3. B.M.

Lepas intus-concamerata, *Martini.*
Patella trochiformis, *Chemn.*
Patella trochoides, *Dillw.*
Trochus radians, *Lamk.*
Calyptræa Araucana, *Lesson.*
Chili and Peru.

412. CALYPTRÆA (TROCHATELLA) MAMILLARIS, *d'Orb. Voy.* v. 462. B.M.

Calyptræa mamillaris et C. lorica, *Brod.*
Peru; Payta to Guayaquil.

413. CALYPTRÆA (TROCHATELLA) INTERMEDIA, *d'Orb. Voy.* v. 463. t. 59. f. 4–6. B.M.

Peru.

414. CALYPTRÆA (TROCHATELLA) PILEOLUS, *d'Orb. Voy.* v. 463. t. 78. f. 5, 6. B.M.

Southern Patagonia; Falkland Islands.

415. CREPIDULA ACULEATA, *Lamk., d'Orb. Voy.* v. 464. t. 58. f. 4, 5. B.M.

Patella aculeata, *Gmelin.*
Brazils; Patagonia.

416. CREPIDULA PATAGONICA, *d'Orb. Voy.* v. 464. t. 58. f. 1–3. B.M.

Patagonia.

417. CREPIDULA PROTEA, *d'Orb. Voy.* v. 465. B.M.

East coast of America; Patagonia; Brazils.

418. CREPIDULA DILATATA, *Lamk., d'Orb. Voy.* v. 465. t. 58. f. 6. B.M.

Crepidula Peruviana, C. depressa et C. patula, *Desh.*
Crepidula Adolphei et C. nautiloides, *Lesson.*
Crepidula dilatata, C. pallida, C. strigata, et C. unguiformis, *Brod.*

S. America.

C. Patagonica, C. arcuata and *C. protea* are only varieties of *C. dilatata,* caused by the form of the substance to which they are attached. They are often parasitic on each other. It may be doubtful if the Patagonian specimens of *C. aculeata* are not also varieties of this species, and distinct from those found in Rio de Janeiro, *C. foliacea* being apparently intermediate between *C. dilatata* and the specimen of *C. aculeata* from Peru. Indeed the species of these Mollusca require other characters to distinguish them, besides the general form of the shell and the structure of its surface: each species presents the same variety, according to the locality and form of the surface to which it has been attached; and these forms from different localities have been considered the same species, instead of varieties of some peculiar local species; hence *C. fornicata, C. aculeata* and *C. unguis* have been said to be found in many parts of the world, which is inconsistent with our knowledge as regards other Mollusca, but may be the case with these, as they sometimes attach themselves to ships, floating wood, &c., and may be thus carried from one part of the world to the other, and hence obtain a larger geographic distribution than other Mollusca.

The outline of the front edge of the inner lip appears to be changed, as well as the outer form of the shell, by the form of the substance to which the animal is attached; thus in the *unguiform* varieties of *C. dilatata* the front edge of the inner lip is straight, while in most other varieties it is produced, rounded, with a deep sinus on the left side.

419. CREPIDULA FOLIACEA, *Brod., d'Orb. Voy.* v. 468. B.M.
Bolivia.

420. CREPIDULA ARCUATA, *Brod., d'Orb. Voy.* v. 468. B.M.
Peru; Payta.

421. CREPIDULA INCURVA, *Brod., d'Orb. Voy.* v. 468.
Peru; Payta.

Fam. 18. SIPHONARIDÆ.

422. SIPHONARIA LESSONII, *Blainv., d'Orb. Voy.* v. 469. t. 56. f. 12–14. B.M.
Siphonaria læviuscula, *Sow.*
Patagonia; Maldonado; Peru; Callao; Chili; Valparaiso.

423. SIPHONARIA PICTA, *d'Orb. Voy.* v. 469. t. 56. f. 7–11. B.M.
Brazils; Rio de Janeiro.

424. SIPHONARIA PERUVIANA, *d'Orb. Voy.* v. 470.
Meuretia Peruviana, *Sow.*
Cobija.
Not a *Siphonaria*, but a *Gadinia* (Gray, Ann. Phil. 1824).

Fam. 19. HALIOTIDÆ.

425. SCISSURELLA CONICA, *d'Orb. Voy.* v. 470. t. 78. f. 7–9.
Falkland Islands.

Fam. 20. FISSURELLIDÆ.

426. RIMULA CONICA, *d'Orb. Voy.* v. 471. t. 78. f. 10, 11. B.M.
Falkland Islands.
This is a *Puncturella*, not a true *Rimula*, having a subapical internal canal.

427. FISSURELLA PICTA, *Lamk., d'Orb. Voy.* v. 472. B.M.
Patella picta, *Gmelin.*
Fissurella oriens, *Sow.*
Chili; Valparaiso.

428. FISSURELLA CRASSA, *Lamk., d'Orb. Voy.* v. 472. B.M.
Fissurella crassa et F. clypeiformis, *Sow.*
Chili.

429. FISSURELLA NIGRA, *Lesson, d'Orb. Voy.* v. 473. B.M.
Fissurella violacea, *Eschsch.*
Fissurella grandis, *Sow.*
Chili.

430. FISSURELLA RADIOSA, *Lesson, d'Orb. Voy.* v. 478. B.M.
Patagonia; Falkland Islands.

431. FISSURELLA MICROTREMA, *Sow., d'Orb. Voy.* v. 473. B.M.
Peru; Bolivia.

432. FISSURELLA PERUVIANA, *Lamk., d'Orb. Voy.* v. 474. B.M.
Fissurella affinis, *Gray.*
Fissurella subrotunda, *Desh.*
Peru; Bolivia.

433. FISSURELLA LIMBATA, *Sow., d'Orb. Voy.* v. 474. B.M.
Chili.

434. FISSURELLA COSTATA, *Lesson, d'Orb. Voy.* v. 474. B.M.
Fissurella rudis, *Desh.*
Fissurella Chilensis et latemarginata?, *Sow.*
Chili.

435. FISSURELLA MAXIMA, *Sow., d'Orb. Voy.* v. 475. t. 64. f. 4-7. B.M.
Chili.

There is a curious specimen in the collection marked *F. maxima*, from Valparaiso, with the apical aperture absent, so that the vent must have opened over the back of the neck, as in *Parmophorus* and *Emarginula*. The front edge of the shell is broken, but there is no appearance of there having been any frontal notch as in *Emarginula*, or the truncation of *Parmophorus*.

436. FISSURELLA PATAGONICA, *d'Orb. Voy.* v. 476. t. 64. f. 13. B.M.
Brazils.

437. FISSURELLA FONTAINIANA, *d'Orb. Voy.* v. 477. t. 78. f. 12-14. B.M.
Peru.

438. FISSURELLA BIRADIATA, *Frembly, d'Orb. Voy.* v. 477.
Valparaiso.

439. FISSURELLIDEA MEGATREMA, *d'Orb. Voy.* v. 477. t. 63. f. 5–10. B.M.
Patagonia.

440. ACMÆA SCURRA, *d'Orb. Voy.* v. 478. t. 64. f. 11–14. B.M.
Patella Scurra, *Lesson.*
Acmæa mitra, *Esch.*
Chili; Arica (on *Fucus*).
The type of the genus *Scurria.*

441. ACMÆA SCUTUM, *Esch., d'Orb. Voy.* v. 479. t. 64. f. 8–10. B.M.
Lottia punctata, *Gray.*
Chili; Bolivia; Peru.

442. ACMÆA SUBRUGOSA, *d'Orb. Voy.* v. 479. B.M.
Brazils.

Fam. 21. PATELLIDÆ.

443. PATELLA CLYPEATER, *Lesson, d'Orb. Voy.* v. 480. B.M.
Chili.

444. PATELLA DEAURATA, *Gmelin, d'Orb. Voy.* v. 480. B.M.
Patagonia; Falkland Islands.

445. PATELLA ZEBRINA, *Lesson, d'Orb. Voy.* v. 480. t. 65. f. 1–3. B.M.
Patella Conceptionis, *Lesson.*
Lottia zebrina, *Gray.*
Chili.

446. PATELLA PRETREI, *d'Orb. Voy.* v. 481. t. 78. f. 15–17. B.M.
Chili; Bolivia.

447. PATELLA PARASITICA, *d'Orb. Voy.* v. 481. t. 81. f. 1–3. B.M.
Chili; Peru.

448. PATELLA ARAUCANA, *d'Orb. Voy.* v. 482. t. 65. f. 4–6. B.M.

Valparaiso.

Patella Pretrei, P. parasitica, P. Araucana, and *P. Ceciliana* are only varieties of *P. zebrina,* dependent on the locality and form of the body to which they are attached, and the abundance or scarcity of the food within their reach. They are *Patellæ,* and not *Lottiæ.*

449. PATELLA MAXIMA, *d'Orb. Voy.* v. 482. B.M.

Peru; Payta.

450. PATELLA CECILIANA, *d'Orb. Voy.* v. 482. t. 81. f. 4–6? B.M.

Falkland Islands.

Fam. 22. CHITONIDÆ.

451. CHITON PERUVIANUS, *Lamk., d'Orb. Voy.* v. 483. B.M.

Peru.

452. CHITON SCABRICULUS, *Sow., d'Orb. Voy.* v. 483. B.M.

Peru.

453. CHITON TUBERCULIFERUS, *Sow., d'Orb. Voy.* v. 483. ? B.M.

Chiton spiniferus, *Frembly.*

Chili; Bolivia; Peru.

454. CHITON HIRUNDINIFORMIS, *Sow., d'Orb. Voy.* v. 484. B.M.

Peru.

455. CHITON OLIVACEUS, *Sow., d'Orb. Voy.* v. 484. B.M.

Chiton magnificus, *Desh.*

Chili.

456. CHITON COQUIMBENSIS, *Frembly, d'Orb. Voy.* v. 485. B.M.

Chili; Bolivia; Peru.

457. CHITON CUMINGII, *Frembly, d'Orb. Voy.* v. 485. B.M.
Peru.

458. CHITON GRANOSUS, *Frembly, d'Orb. Voy.* v. 485. B.M.
Chili.

459. CHITON PUNCTULATISSIMUS, *Sow., d'Orb. Voy.* v. 485. B.M.
Peru.

460. CHITON STOKESII, *Brod., d'Orb. Voy.* v. 486. B.M.
Peru.

461. CHITON INCA, *d'Orb. Voy.* v. 486. t. 65. f. 20-24. B.M.
Peru.

462. CHITON BICOSTATUS, *d'Orb. Voy.* v. 486. t. 81. f. 7–9. B.M.
Peru; Arica.

463. CHITON LINEOLATUS, *Frembly, d'Orb. Voy.* v. 487. B.M.
Chili.

464. CHITON CHILENSIS, *Frembly, d'Orb. Voy.* v. 487.
Chili.

465. CHITON ELEGANS, *Frembly, d'Orb. Voy.* v. 487. B.M.
Peru; Arica.

466. CHITON DISJUNCTUS, *Frembly, d'Orb. Voy.* v. 487. B.M.
Chili.

467. CHITON SWAINSONII, *Sow., d'Orb. Voy.* v. 488. B.M.
Chili; Peru.

468. CHITON CHILOENSIS, *Sow., d'Orb. Voy.* v. 488. B.M.
Chili.

469. CHITON TEHUELCHUS, *d'Orb. Voy.* v. 488. t. 65. f. 7–13. B.M.
Patagonia.

470. CHITON ISABELLEI, *d'Orb. Voy.* v. 488. t. 65. f. 14–19. B.M.
Patagonia.

471. CHITON PULCHELLUS, *Gray, d'Orb. Voy.* v. 489. B.M.
Peru.

Class V. LAMELLIBRANCHIA.

Order I. ORTHOCONQUES.

Suborder I. SINUPALLEALES.

Fam. 1. PHOLADIDÆ.

472. PHOLAS COSTATA, *Linn., d'Orb. Voy.* v. 496. B.M.
Isles Malouines.

473. PHOLAS PUSILLUS, *Linn., d'Orb. Voy.* v. 497.
Pholas clavata, *Lamk.*
Pholas striata, *G. Sow.*
Brazils; Rio de Janeiro.

474. PHOLAS LANCEOLATA, *d'Orb. Voy.* v. 497. t. 77. f. 17, 18. B.M.
Patagonia; Rio Negro.

475. PHOLAS LAMELLOSA, *d'Orb. Voy.* v. 498. t. 77. f. 20, 21. B.M.
Patagonia; Rio Negro.

476. PHOLAS CHILOENSIS, *Molina, d'Orb. Voy.* v. 498. B.M.
Peru; Payta.

477. PHOLAS SUBTRUNCATA, *Sow., d'Orb. Voy.* v. 499. B.M.
Peru; Payta.

478. PHOLAS CRUCIGER, *Sow., d'Orb. Voy.* v. 499.
Columbia; Puna.

479. PHOLAS MELANURA, *Sow., d'Orb. Voy.* v. 499.
Ecuador; Monte Criste.

480. PHOLAS TUBIFERA, *Sow., d'Orb. Voy.* v. 499. B.M.
Peru; Payta.

481. PHOLAS QUADRA, *Sow., d'Orb. Voy.* v. 500.
Ecuador; Monte Criste.

482. PHOLAS CURTA, *Sow., d'Orb. Voy.* v. 500.
Ecuador; Isle de los Leones.

483. PHOLAS CORNEA, *Sow., d'Orb. Voy.* v. 500.
Ecuador; Chiriqui.

484. PHOLAS GIBBOSA, *d'Orb. Voy.* v. 501.
Xylophaga gibbosa, *Sow.*
Chili; Valparaiso (*Cuming*).

Fam. 2. MYACIDÆ.

485. SOLEN SCALPRUM, *Brod., d'Orb. Voy.* v. 505. t. 77. f. 22. B.M.
Patagonia; Rio Negro.

486. SOLEN MACHA, *Molina, d'Orb. Voy.* v. 505. B.M.
Solen gladiolus, *Gray.*
Chili; Valparaiso.

487. SOLEN GAUDICHAUDI, *Chemn., d'Orb. Voy.* v. 505. B.M.
Chili; Coquimbo.

488. PANOPÆA ABBREVIATA, *Valenc., d'Orb. Voy.* v. 507. B.M.
Patagonia; between Rio Negro (No. 133); Bay of San Blas.

489. MACTRA FRAGILIS, *Chemn., d'Orb. Voy.* v. 508. B.M.
Mactra ovalina, *Lamk.*
Brazils; Rio de Janeiro; Patagonia; "Baie Blanche, *Voy.* no. 130."

490. MACTRA PETITII, *d'Orb. Voy.* v. 509. t. 77. f. 23, 24. B.M.
Brazils; Rio de Janeiro (single valve).

491. MACTRA ISABELLEANA, *d'Orb. Voy.* v. 509. t. 77. f. 25, 26. B.M.
Mouth of the Plata; Maldonado; Montevideo.

492. MACTRA PATAGONICA, *d'Orb. Voy.* v. 509. t. 77. f. 27. B.M.
Patagonia; Rio Negro (single valve, bad state).

493. MACTRA CLERYANA, *d'Orb. Voy.* v. 510. B.M.
Brazils; Rio de Janeiro.

494. MACTRA EDULIS, *Brod., d'Orb. Voy.* v. 510. B.M.
Maghellan Straits; Port Famine (eaten).

495. MACTRA BICOLOR, *d'Orb. Voy.* v. 510. t. 78. f. 18. B.M.
Mulinia bicolor, *Gray.*
Chili; Valparaiso.

496. MACTRA BYRONENSIS, *d'Orb. Voy.* v. 511. B.M.
Mulinia Byronensis, *Gray.*
Callao; Chili; Valparaiso.

Fam. 3. ANATINIDÆ.

497. ANATINA COSTATA, *Sow., d'Orb. Voy.* v. 512.
Neæra costata, *Gray.*
Ecuador; Santa Elena.

498. PERIPLOMA INÆQUIVALVIS, *Schum., d'Orb. Voy.* v. 513.
Anatina trapezoides, *Lamk.*
Brazils; Santos.

499. PERIPLOMA COMPRESSA, *d'Orb. Voy.* v. 514. t. 78. f. 19, 20. B.M.
Northern Patagonia; San Blas.

500. PERIPLOMA OVATA, *d'Orb. Voy.* v. 514. t. 80. f. 10–12. B.M.
Northern Patagonia; San Blas (broken).

501. PERIPLOMA PLANIUSCULA, *Sow., d'Orb. Voy.* v. 515.
Santa Elena.

502. PERIPLOMA LENTICULARIS, *Sow., d'Orb. Voy.* v. 515.
Isle de la Muerte.

503. LYONSIA PATAGONICA, *d'Orb. Voy.* v. 517. t. 81. f. 13, 14. B.M.
Northern Patagonia; San Blas.

504. LYONSIA ALVAREZII, *d'Orb. Voy.* v. 517. t. 81. f. 15–17. B.M.
Northern Patagonia; San Blas.

505. LYONSIA MALVINENSIS, *d'Orb. Voy.* v. 518. t. 81. f. 18–20. B.M
Isles Malouines.

506. LYONSIA CUNEATA, *d'Orb. Voy.* v. 518. B.M.
Anatina cuneata, *Gray.*
? Lyonsia picta, *Sow.*
Peru; Arica.

507. LYONSIA BREVIFRONS, *Sow.; d'Orb. Voy.* v. 518.
Ecuador; Santa Elena (*Cuming*).

508. THRACIA RUGOSA, *Conrad, d'Orb. Voy.* v. 519. B.M.
Brazils; Rio de Janeiro.

509. SAXICAVA MERIDIONALIS, *d'Orb. Voy.* v. 521. t. 81. f. 21, 22. B.M.
Patagonia; Isles Malouines.

510. SAXICAVA SOLIDA; *Sow., d'Orb. Voy.* v. 521. B.M.
Peru; Lima; Callao.

511. SAXICAVA TENUIS, *Sow.*, *d'Orb. Voy.* v. 521.
Peru; Pascomayo.

512. SAXICAVA PURPURASCENS, *Sow.*, *d'Orb. Voy.* v. 522.
Ecuador; Isle de la Muerte.

Fam. 4. SOLECURTIDÆ.

513. SOLECURTUS PLATENSIS, *d'Orb. Voy.* v. 523. t. 81. f. 23. B.M.
Brazils; Rio de Janeiro (single valve).
Uruguay; Montevideo (larger).

514. SOLECURTUS DOMBEYI, *d'Orb. Voy.* v. 524. B.M.
Solen Dombeyi, *Lamk.*
Peru; Callao.

Fam. 5. TELLINIDÆ.

515. LAVIGNON LINEATA, *Say*, *d'Orb. Voy.* v. 526.
Lutraria papyracea, *Lamk.*
Lutraria lineata, *Say.*
Brazils.

516. LAVIGNON PAPYRACEA, *d'Orb. Voy.* v. 527. B.M.
Mactra papyracea, *Chemn.*
Lutraria plicatella, *Lamk.*
Brazils; Rio de Janeiro; Northern Patagonia.

517. LAVIGNON MUTICA, *d'Orb. Voy.* v. 527. B.M.
Peru; Payta.

518. LAVIGNON LAMELLOSA, *d'Orb. Voy.* v. 527.
Cumingia lamellosa, *Sow.*
Peru; Payta (*Cuming*).

519. LAVIGNON TRIGONULARIS, *d'Orb. Voy.* v. 528.
Cumingia trigonularis, *Sow.*
Ecuador; Santa Elena.

520. LAVIGNON COARCTATA, *d'Orb. Voy.* v. 528.
Cumingia coarctata, *Sow.*
Ecuador; Caraccas.

521. DONACILLA SOLENOIDES, *d'Orb. Voy.* v. 529. B.M.
Erycina solenoides, *Brod.*
Patagonia.

522. DONACILLA CHILENSIS, *d'Orb. Voy.* v. 530., B.M.
Mesodesma donacia, *Reeve* (not Mactra donacia, *Lamk.*, from New Zealand).
Chili; Valparaiso (eaten).

523. AMPHIDESMA VARIEGATA, *Lamk., d'Orb. Voy.* v. 531. B.M.
Brazils; Rio de Janeiro.

524. AMPHIDESMA RETICULATA, *Gray, d'Orb. Voy.* v. 531. B.M.
Tellina reticulata, *Linn.*
Brazils; Rio de Janeiro.

525. AMPHIDESMA SOLIDA, *Gray, d'Orb. Voy.* v. 532. B.M.
Peru; Callao.

526. AMPHIDESMA FORMOSA, *Sow., d'Orb. Voy.* v. 532.
Ecuador; Santa Elena.

527. AMPHIDESMA PALLIDA, *Sow., d'Orb. Voy.* v. 532.
Ecuador; Solango.

528. AMPHIDESMA PURPURASCENS, *Sow., d'Orb. Voy.* v. 533.
Ecuador; Santa Elena.

529. AMPHIDESMA LENTICULARIS, *Sow., d'Orb. Voy.* v. 533.
Ecuador; Santa Elena.

530. AMPHIDESMA ROSEA, *Sow., d'Orb. Voy.* v. 533.
Peru; Tumbez.

531. AMPHIDESMA LÆVIS, *Sow.*, *d'Orb. Voy.* v. 533.
Ecuador; Xipixapi.

532. AMPHIDESMA ELLIPTICA, *Sow.*, *d'Orb. Voy.* v. 533.
Ecuador; Monte Criste.

533. AMPHIDESMA CORRUGATA, *Sow.*, *d'Orb. Voy.* v. 534.
Peru; Iquique.

534. AMPHIDESMA PULCHRA, *Sow.*, *d'Orb. Voy.* v. 534.
Ecuador; Caraccas.

535. TELLINA PUNICEA, *Born*, *d'Orb. Voy.* v. 535.
Donax Martinicensis, *Lamk.*
Tellina alternata, *Say.*
Brazils.

536. TELLINA CARNARIA, *Linn.*, *d'Orb. Voy.* v. 536. B.M.
Lucina carnaria, *Lamk.*
Brazils.

537. TELLINA CONSTRICTA, *Philippi*, *d'Orb. Voy.* v. 536. B.M.
Solen constrictus, *Brug.*
Psammobia Cayennensis, *Lamk.*
Brazils; Rio de Janeiro.

538. TELLINA BRASILIANA, *Lamk.*, *d'Orb. Voy.* v. 537. B.M.
Tellina lineata, *Turton.*
Brazils; Rio de Janeiro.

539. TELLINA CLERYANA, *d'Orb. Voy.* v. 537. t. 81. f. 24, 25. B.M.
Brazils; Rio de Janeiro (single valves).

540. TELLINA PETITIANA, *d'Orb. Voy.* v. 537. t. 81. f. 26, 27. B.M.
Brazils; Cape St. Thomas (80 mètres de profundeur) (single valve).

541. TELLINA EBURNEA, *Hanley, d'Orb. Voy.* v. 538. B.M.
Peru; Payta.

542. ARCOPAGIA SOLIDA, *d'Orb. Voy.* v. 539. B.M.
Solecurtus solidus, *Gray.*
Peru; Arica.

543. DONAX BRASILIENSIS, *d'Orb. Voy.* v. 540. B.M.
Capsa Brasiliensis, *Lamk.*
Brazils; Rio de Janeiro.

544. DONAX CAYANENSIS, *Lamk., d'Orb. Voy.* v. 540. B.M.
Donax rugosa, *Lamk.*
Brazils; Bahia.

545. DONAX RADIATA, *Valenc., d'Orb. Voy.* v. 540. B.M.
Peru; Arica.

546. DONAX OBESA, *d'Orb. Voy.* v. 541. t. 81. f. 28, 30. B.M.
Peru; Payta.

547. DONAX PAYTENSIS, *d'Orb. Voy.* v. 541. B.M.
Peru; Payta.

Fam. 6. SOLENELLIDÆ.

548. SOLENELLA NORRISII, *Sow., d'Orb. Voy.* v. 543. B.M.
Ctenoconcha Norrisii, *Gray.*
Chili; Valparaiso (partly broken).

549. LEDA PATAGONICA, *d'Orb. Voy.* v. 544. t. 82. f. 1–3. B.M.
Nucula lanceolata, *d'Orb.*
Patagonia; Bay of San Blas (dead).

550. LEDA SOWERBYANA, *d'Orb. Voy.* v. 544.
Nucula lanceolata, *Sow.*, not *Lamk.*
Ecuador; Xipixapi.

551. LEDA ELONGATA, *d'Orb. Voy.* v. 545.
Nucula elongata, *Sow.*
Ecuador; Xipixapi (*Cuming*).

552. LEDA CRENIFERA, *d'Orb. Voy.* v. 545.
Nucula crenifera, *Sow.*
Ecuador; Xipixapi (*Cuming*).

553. LEDA GIBBOSA, *d'Orb. Voy.* v. 545. B.M.
Nucula gibbosa, *Sow.*
Peru; Payta.

554. LEDA ELENENSIS, *d'Orb. Voy.* v. 545.
Nucula Elenensis, *Sow.*
Ecuador; Santa Elena.

555. LEDA EBURNEA, *d'Orb. Voy.* v. 546.
Nucula eburnea, *Sow.*
Ecuador; Caraccas.

556. LEDA CUNEATA, *d'Orb. Voy.* v. 546.
Nucula cuneata, *Sow.*
Chili; Valparaiso.

557. LEDA ORNATA, *d'Orb. Voy.* v. 546. t. 82. f. 4–6.
Peru; Payta.

Fam. 7. VENUSIDÆ.

558. PETRICOLA PATAGONICA, *d'Orb. Voy.* v. 547. t. 82. f. 7–10. B.M.
Patagonia; Rio Negro.

559. PETRICOLA RUGOSA, *Sow., d'Orb. Voy.* v. 548.
Chili; Concepcion.

560. PETRICOLA TENUIS, *Sow., d'Orb. Voy.* v. 548.
Peru.

561. PETRICOLA SOLIDA, *Sow., d'Orb. Voy.* v. 548. B.M.
Peru; Arica.

562. PETRICOLA DISCORS, *Sow., d'Orb. Voy.* v. 548.
Peru.

563. PETRICOLA CONCINNA, *Sow., d'Orb. Voy.* v. 549.
Peru; Arica.

564. PETRICOLA DENTICULATA, *Sow., d'Orb. Voy.* v. 549. B.M.
Peru; Arica (elongate). Peru; Payta (shorter, thick).

565. PETRICOLA ELLIPTICA, *Sow., d'Orb. Voy.* v. 549.
Peru; Payta.

566. PETRICOLA OBLONGA, *Sow., d'Orb. Voy.* v. 549.
Peru; Pascomayo.

567. VENUS PURPURATA, *d'Orb. Voy.* v. 552. B.M.
Cytherea purpurata, *Lamk.*
Patagonia and Maldonado.

568. VENUS MACULOSA, *Linn., d'Orb. Voy.* v. 552. B.M.
Cardium tigrina, *Martyn.*
Brazils; Rio de Janeiro.

569. VENUS PHILIPPII, *d'Orb. Voy.* v. 553. B.M.
Cytherea concentrica, *Lamk.*
Cytherea Patagonica, *Philippi.*
Brazils; Rio de Janeiro (not Patagonia).

570. VENUS FLEXUOSA, *Linn., d'Orb. Voy.* v. 553. B.M.
Cytherea flexuosa, *Lamk.*
Brazils; Rio de Janeiro.

571. VENUS DYSERA, *Linn., d'Orb. Voy.* v. 554. B.M.
Cardium discors, *Martyn.*
Venus cancellata, *Lamk.*
Brazils; Rio de Janeiro.

572. VENUS RUBIGINOSA, *d'Orb. Voy.* v. 554. B.M.
Cytherea rubiginosa, *Philippi.*
Venus fulminata, *Menke.*
Brazils; Rio de Janeiro.

573. VENUS PAPHIA, *Linn., d'Orb. Voy.* v. 554. B.M.
Anus rugosa, *Chemn.*
Brazils; Rio de Janeiro.

574. VENUS RUGOSA, *Chemn., d'Orb. Voy.* v. 555. B.M.
Venus rugosa orientalis, *Chemn.*
Brazils; Rio de Janeiro.

575. VENUS PECTORINA, *Lamk., d'Orb. Voy.* v. 555. B.M.
Venus elegans, *Gray.*
Brazils; Rio de Janeiro.

576. VENUS PORTESIANA, *d'Orb. Voy.* v. 556. t. 83. f. 1, 2.
Brazils.

577. VENUS ISABELLEANA, *d'Orb. Voy.* v. 556. t. 83. f. 3, 4.
Uruguay; Maldonado.

578. VENUS TEHUELCHA, *d'Orb. Voy.* v. 556. B.M.
Venus Patagonica, *d'Orb.*, not *Lamk.*
Cytherea rostrata, *Koch.*
Patagonia.

579. VENUS ALVAREZII, *d'Orb. Voy.* v. 557. t. 83. f. 1, 2. B.M.
Patagonia; Rio Negro (single valve).

580. VENUS THACA, *d'Orb. Voy.* v. 557. t. 82. f. 11. B.M.
Chama Thaca, *Molina.*
Venus Dombeyi, *Lamk.*
Venus ignobilis, *Philippi.*
Chili; Valparaiso; Peru; Arica.

581. VENUS COSTELLATA, *Sow., d'Orb. Voy.* v. 558. ? B.M.
Peru; Arica and Cobija; Callao.

582. VENUS MACTRACEA, *Brod., d'Orb. Voy.* v. 558.
Chili; Valparaiso.

583. VENUS INCONSPICUA, *d'Orb. Voy.* v. 558.
Cytherea inconspicua, *Sow.*
Peru; Payta.

584. VENUS PANNOSA, *d'Orb. Voy.* v. 558. B.M.
Cytherea pannosa, *Sow.*
Peru; Callao; Chili; Coquimbo.

585. VENUS PERUVIANA, *Sow., d'Orb. Voy.* v. 559. B.M.
Peru; Callao.

586. VENUS COMPTA, *Brod., d'Orb. Voy.* v. 559.
Peru; Sechura.

587. VENUS PLANULATA, *d'Orb. Voy.* v. 559. B.M.
Cytherea planulata, *Sow.*
Chili; Coquimbo.

588. VENUS SPURCA, *Sow., d'Orb. Voy.* v. 559.
Chili; Valparaiso (*Cuming*).

589. VENUS CHILENSIS, *Sow., d'Orb. Voy.* v. 560.
Chili; Valparaiso.
? Venus Thaca, var., *d'Orb. l. c.* 560.

590. VENUS LENTICULARIS, *Sow., d'Orb. Voy.* v. 560. B.M.
Chili; Valparaiso.

591. VENUS OPACA, *Sow., d'Orb. Voy.* v. 560. B.M.
Venus expallescens, *Philippi.*
Peru; Arica.

592. VENUS DISCREPANS, *Sow., d'Orb. Voy.* v. 561.
Peru; Islay.

593. VENUS LUPANARIA, *d'Orb. Voy.* v. 561. B.M.
Cytherea lupanaria, *Lesson.*
Cytherea Dione, var., *Brod.*
Cytherea semilamellosa, *Chemn.*
Peru; Payta.

594. VENUS HISTRIONICA, *Sow., d'Orb. Voy.* v. 561.
Ecuador; Santa Elena.

595. VENUS SUBRUGOSA, *Sow., d'Orb. Voy.* v. 561. B.M.
Peru.

596. VENUS CYCLOIDES, *d'Orb. Voy.* v. 562. B.M.
Cytherea gigantea, *Sow.*
Peru; Payta.

597. VENUS TORTUOSA, *d'Orb. Voy.* v. 562.
Cytherea tortuosa, *Brod.*
Ecuador; Xipixapi.

598. VENUS ANTIQUA, *Gray, d'Orb. Voy.* v. 562. B.M.
Peru; Lima.

599. VENUS ASPERRIMA, *Sow., d'Orb. Voy.* v. 562.
Ecuador; Isle of los Lobos.

600. VENUS DISCORS, *Sow., d'Orb. Voy.* v. 563.
Ecuador; Santa Elena.

601. VENUS CUMINGII, *d'Orb. Voy.* v. 563. B.M.
Cytherea modesta, *Sow.*, not *Dubois.*
Peru; Callao.

602. VENUS MARIÆ, *d'Orb. Voy.* v. 563.
Venus Cypria, *Sow.*, not *Brocchi.*
Ecuador; Isle de la Plata.

603. VENUS CRENIFERA, *Sow., d'Orb. Voy.* v. 563.
Peru; Payta.

604. VENUS PULICARIA, *Brod., d'Orb. Voy.* v. 564.
Ecuador.

605. VENUS ALTERNATA, *d'Orb. Voy.* v. 564.
Cytherea alternata, *Brod.*
Ecuador; Monte Criste.

606. VENUS GNIDIA, *Brod., d'Orb. Voy.* v. 564. B.M.
Peru; Payta.

607. VENUS SOLANGENSIS, *d'Orb. Voy.* v. 564.
Cytherea radiata, *Sow.*, not *Chemn.*, nor *Risso.*
Ecuador; Xipixapi.

608. VENUS PAYTENSIS, *d'Orb. Voy.* v. 565. B.M.
Cytherea affinis, *Brod.*, not *Gmelin.*
Peru; Payta.

609. VENUS SQUALIDA, *a'Orb. Voy.* v. 565.
Cytherea squalida, *Sow.*
Ecuador; Santa Elena.

610. VENUS NEGLECTA, *Gray, d'Orb. Voy.* v. 565. B.M.
Peru; Payta.

611. VENUS COLUMBIENSIS, *Sow., d'Orb. Voy.* v. 566.
Ecuador; Santa Elena.

*VENUS CALIFORNIENSIS, *Brod.* B.M.
Peru; Payta (*M. Fontaine*).

*VENUS ——? B.M.
——? (*M. Fontaine*).

*VENUS (CYCLINA ——?). B.M.
Peru (single valve); Callao (*Voy.* no. 214): rare.

*VENUS (CYCLINA). B.M.
Brazils (single valve); Rio de Janeiro.

Fam. 8. CYCLASIDÆ.

612. CYCLAS PARANACENSIS, *d'Orb. Voy.* v. 567. t. 83. f. 25–27. B.M.

Cyrena Paranacensis, *d'Orb.*

Uruguay; Parana.
Corrientes (no. 93, 94); Buenos Ayres.

613. CYCLAS VARIEGATA, *d'Orb. Voy.* v. 567. t. 82. f. 15–17. B.M.

Cyrena variegata, *d'Orb.*

Uruguay; Parana; Banda Oriental; Buenos Ayres (no. 195).

614. CYCLAS ARGENTINA, *d'Orb. Voy.* v. 568. t. 83. f. 7–9. B.M.

Rivulet in Bay of Montevideo (broken).

615. CYCLAS PULCHELLA, *d'Orb. Voy.* v. 568. t. 83. f. 10–12.

Uruguay; rivulet near Maldonado.

616. CYCLAS CHILENSIS, *d'Orb. Voy.* v. 568. t. 83. f. 13–15. B.M.

Chili; Valdivia (in aquatic mosses).

617. CYCLAS FONTAINEI, *d'Orb. Voy.* v. 569. t. 83. f. 16, 17. B.M.

Ecuador; Guayaquil.

Cyclas Argentina is a *Cyclas*; *Cyclas Chilensis* a *Pera*.

Cyclas Paranacensis and *C. variegata* are *Cyrenæ*, with striated lateral teeth.

C. Fontainei is a *Cyrena*, with short smooth lateral teeth.

Fam. 9. CORBULIDÆ.

618. CORBULA PATAGONICA, *d'Orb. Voy.* v. 570. t. 82. f. 18–20. B.M.

Patagonia; San Blas (*Voy.* no. 126).

619. CORBULA BICARINATA, *Sow.*, *d'Orb. Voy.* v. 571.
Ecuador; Santa Elena.

620. CORBULA BIRADIATA, *Sow.*, *d'Orb. Voy.* v. 571.
Ecuador; Chiriqui.

621. CORBULA NASUTA, *Sow.*, *d'Orb. Voy.* v. 571.
Ecuador; Xipixapi.

622. CORBULA OVULATA, *Sow.*, *d'Orb. Voy.* v. 571.
Ecuador; Xipixapi.

623. SPHENA CLERYANA, *d'Orb. Voy.* v. 572. t. 83. f. 18–20.
Brazils; Cape St. Thomas.

624. AZARA LABIATA, *d'Orb. Voy.* v. 573. t. 83. f. 22. B.M.
Mya labiata, *Maton.*
Potamomya ochræa, *Hinds.*
Potamomya nimbosa, *Sow.*
Corbula nimbosa, *Reeve.*
Corbula ochreata, *Reeve.*
La Plata, in brackish water; Montevideo (*Voy.* no. 5).

625. PANDORA ARCUATA, *Sow.*, *d'Orb. Voy.* v. 574.
Ecuador; Santa Elena.

626. PANDORA RADIATA, *Sow.*, *d'Orb. Voy.* v. 575.
Ecuador; Isle de la Muerte.

Suborder II. INTEGROPALLEALES.

Fam. 1. ASTARTIDÆ.

627. ASTARTE LONGIROSTRA, *d'Orb. Voy.* v. 576. t. 83. f. 21–24. B.M.
Isles Malouines (single valve) (*Du Petit Thouars*).

628. CRASSATELLA GIBBOSA, *Sow.*, *d'Orb. Voy.* v. 578. B.M.
Peru; Payta.

Fam. 2. CARDITIDÆ.

629. CARDITA THOUARSII, *d'Orb. Voy.* v. 579. t. 84. f. 1–3. B.M.
Isles Malouines (single valve) (*Du Petit Thouars*).

630. CARDITA MALOUINÆ, *d'Orb. Voy.* v. 580. t. 84. f. 46. B.M.
Isles Malouines (*Du Petit Thouars*).

631. CARDITA COMPRESSA, *Reeve, d'Orb. Voy.* v. 580. B.M.
Cardita flabellum, *Reeve.*
Chili; Valparaiso (single valve).

632. CARDITA NAVIFORMIS, *Reeve, d'Orb. Voy.* v. 580. B.M.
? Cardita minima, *Sow.*
Peru; Arica (*Voy.* no. 157).

633. CARDITA TEGULINA, *d'Orb. Voy.* v. 581.
Cardita tegulata, *Reeve.*
Chili; Valparaiso.

634. CARDITA SEMEN, *Reeve, d'Orb. Voy.* v. 581.
Bolivia; Mexillones.

635. CARDITA SPURCA, *Sow., d'Orb. Voy.* v. 581. t. 82. f. 13, 14. B.M.
Peru; Callao (*Voy.* no. 183).

636. CARDITA LATICOSTA, *d'Orb. Voy.* v. 582.
Cardita laticostata, *Sow.*, not *Pusch.*
Peru; Ecuador.

637. CARDITA RADIATA, *Brod., d'Orb. Voy.* v. 582.
Columbia; Solango; Panama.

Fam. 3. LUCINIDÆ.

638. LUCINA JAMAICENSIS, *Lamk.*, *d'Orb. Voy.* v. 583. B.M.

Venus Jamaicensis, *Chemn.*

Brazils; Rio de Janeiro (*Voy.* no. 19).

639. LUCINA QUADRISULCATA, *d'Orb. Voy.* v. 584. B.M.

Lucina divaricata, *Lamk.*

Brazils; Rio de Janeiro (*Voy.* no. 11).

640. LUCINA SEMIRETICULATA, *d'Orb. Voy.* v. 584. t. 84. f. 7–9. B.M.

Patagonia (discoloured); Brazils; Rio de Janeiro (single valves) (*Voy.* no. 125).

641. LUCINA COSTATA, *d'Orb. Voy.* v. 586. B.M.

Brazils; Rio de Janeiro (single valve).

642. LUCINA GUARANIANA, *d'Orb. Voy.* v. 586. t. 84. f. 10, 11. B.M.

Brazils; Rio de Janeiro.

643. LUCINA PORTESIANA, *d'Orb. Voy.* v. 587. t. 84. f. 12, 13. B.M.

Brazils; Rio de Janeiro.

644. LUCINA VILARDEBOÆNA, *d'Orb. Voy.* v. 587. t. 84. f. 14, 15. B.M.

La Plata; Maldonado.

645. LUCINA PATAGONICA, *d'Orb. Voy.* v. 587. t. 84. f. 16, 17. B.M.

Patagonia; San Blas (*Voy.* no. 124).

646. LUCINA CRYPTELLA, *d'Orb. Voy.* v. 587. t. 84. f. 18–20. B.M.

Brazils; Pernambuco.

Lucina Pennsylvanica and *L. costata* have large compressed lateral teeth.

L. Guaraniana and *L. Vilardeboœna* have rudimentary compressed lateral teeth and a thick hinge-margin.

L. quadrisulcata (only a variety of *L. divaricata*), *L. semireticulata*, *L. Portesiana* and *L. Patagonica* have no lateral teeth and a thin cardinal margin; these have all an external marginal cartilage.

L. cryptella has an internal cartilage and no lateral teeth.

647. ERYCINA PETITIANA, *Recluz, d'Orb. Voy.* v. 589.
Peru; Callao.

Fam. 4. CARDIDÆ.

648. CARDIUM SERRATUM, *Linn., d'Orb. Voy.* v. 590. B.M.
Cardium lævigatum, *Gmelin.*
Cardium citrinum serratum, *Chemn.*
Brazils; Rio de Janeiro (*Voy.* no. 227).

649. CARDIUM MURICATUM, *Linn., d'Orb. Voy.* v. 591. B.M.
Brazils; Rio de Janeiro (*Voy.* no. 28).

650. CARDIUM LAMARCKII, *d'Orb. Voy.* v. 591.
Cardium Brasilianum, *Lamk.*
Brazils.

651. CARDIUM MACULOSUM, *Wood, d'Orb. Voy.* v. 592.
Cardium multistriatum, *Sow.*
Columbia; Santa Elena.

652. CARDIUM GRANIFERUM, *Brod., d'Orb. Voy.* v. 592.
Ecuador.

653. CARDIUM BIANGULATUM, *Sow., d'Orb. Voy.* v. 592.
Ecuador; Santa Elena.

654. CARDIUM CONSORS, *Brod., d'Orb. Voy.* v. 592.
Ecuador.

655. CARDIUM OBOVALE, *Sow., d'Orb. Voy.* v. 593.
Ecuador.

656. CARDIUM ASPERSUM, *Sow., d'Orb. Voy.* v. 593.
Ecuador; Santa Elena.

657. CARDIUM ELENENSE, *Sow., d'Orb. Voy.* v. 593.
Ecuador; Santa Elena.

658. CARDIUM SENTICOSUM, *Sow., d'Orb. Voy.* v. 593.
Ecuador; Santa Elena.

659. CARDIUM PROCERUM, *Sow., d'Orb. Voy.* v. 594. B.M.
Peru; Payta.

Fam. 5. UNIONIDÆ.

660. IRIDINA TRAPEZIALIS, *d'Orb. Voy.* v. 596. B.M.
Parana; Corrientes.

661. IRIDINA ESULA, *d'Orb. Voy.* v. 597. B.M.
Anodonta esula, *Jan.*
Anodonta Blainvilliana, *Lea.*
Central Region of S. America; Bolivia, in lakes.

662. CASTALIA AMBIGUA, *Lamk., d'Orb. Voy.* v. 598. t. 72. f. 4–10. B.M.
Tetraplodon pectinatum, *Spix.*
Castalia inflata, *d'Orb.*
Brazils; Bolivia; Rivers Amazon and La Plata.

663. CASTALIA QUADRILATERA, *d'Orb. Voy.* v. 599. t. 73. B.M.
Bolivia; Rio de San Miguel.

664. MYCETOPUS SOLENIFORMIS, *d'Orb. Voy.* v. 601. t. 66. B.M
Bolivia; Rio Piray.

665. MYCETOPUS SILIQUOSUS, *d'Orb. Voy.* v. 601. t. 67. B.M.

Anodon siliquosus, *Spix.*
Anodon longinum, *Spix.*

Bolivia; Argentine Republic; Corrientes; Rio Piray.

666. MYCETOPUS VENTRICOSUS, *d'Orb. Voy.* v. 602. t. 72. f. 1–3.

Bolivia; Rio de Tucubata.

667. UNIO PARANENSIS, *Lea, d'Orb. Voy.* v. 603. B.M.

Bolivia (adult); Rio Parana (*Voy.* no. 76); Corrientes (young).

668. UNIO SOLISIANA, *d'Orb. Voy.* v. 604. t. 69. f. 1–3. B.M.

Buenos Ayres; Rio de la Plata (*Voy.* no. 79).

669. UNIO VARIABILIS, *Gray, d'Orb. Voy.* v. 604. t. 71. f. 1–3. B.M.

Mya variabilis, *Maton.*
Unio Matonianus, *d'Orb.*

Buenos Ayres; Rio de la Plata (*Voy.* no. 81).
Corrientes; Rio Batel (*Voy.* no. 84).

670. UNIO FONTAINEANA, *d'Orb. Voy.* v. 605. t. 69. f. 6, 7. B.M.

Brazils; Rio Parahiva.

671. UNIO DELODONTA, *Lamk., d'Orb. Voy.* v. 605. B.M.

Unio lacteola, *Lea.*

Montevideo; Republic of Uruguay; Buenos Ayres; Rio de la Plata.

Unio Paranensis, U. Solisiana, U. variabilis and *U. Delodonta* appear to be varieties of the same species.

672. UNIO CHARRUANA, *d'Orb. Voy.* v. 606. t. 71. f. 8–14. B.M.

Var. smaller. Unio faba, *d'Orb.*

Banda Orientale; Maldonado (*Voy.* no. 51).

673. UNIO RHUACOICA, *d'Orb. Voy.* v. 606. t. 69. f. 4, 5. B.M.
Banda Orientale; Maldonado (*Voy.* no. 90).

674. UNIO MULTISTRIATA, *Lea, d'Orb. Voy.* v. 607. B.M.
Brazils; Rio Parahiva.

675. UNIO HYLÆA, *d'Orb. Voy.* v. 607. t. 69. f. 8, 9. B.M.
Bolivia; Santa Cruz de la Sierra (*Voy.* no. 171).

676. UNIO GUARANIANA, *d'Orb. Voy.* v. 608. t. 69. f. 10–12. B.M.
Corrientes; River Parana, near Itaty (*Voy.* no. 86).

677. UNIO PSAMMOICA, *d'Orb. Voy.* v. 608. t. 71. f. 4–7. B.M.
Corrientes; Parana, near Itaty (*Voy.* no. 23).
Like *Castalia*, but animal of *Unio*.

678. UNIO BURROUGHIANA, *Lea, d'Orb. Voy.* v. 609. B.M.
Montevideo; Banda Orientale de la Plata.

679. UNIO PARALLELIPIPEDON, *Lea, d'Orb. Voy.* v. 609. B.M.
Argentine Republic; Corrientes; Parana (*Voy.* no. 87).

680. UNIO PATAGONICA, *d'Orb. Voy.* v. 610. t. 70. f. 1–4. B.M.
Northern Patagonia; Rio Negro.

681. UNIO OBTUSA, *Féruss., d'Orb. Voy.* v. 610. B.M.
Unio depressa, *Lesson.*
Chili; Valparaiso.

682. UNIO DEPRESSA, *Lamk., d'Orb. Voy.* v. 611. B.M.
Unio Chiliensis, *Gray, Spic. Zool.*
Chili; Valparaiso; La Laguna.

683. MONOCONDYLÆA PARAGUAYANA, *d'Orb. Voy.* v. 612. t. 70. f. 5–7. B.M.
Argentine Republic; Province of Corrientes; Rio Parana (*Voy.* no. 74).

684. MONOCONDYLÆA MINUANA, *d'Orb. Voy.* v. 612. t. 70. f. 8–10. B.M.

Banda Orientale de la Plata; Rio del Rosario (*Voy.* no. 96).

685. MONOCONDYLÆA PARCHAPPII, *d'Orb. Voy.* v. 613. t. 68. f. 1–3. B.M.

Argentine Republic; Corrientes; Rio Parana (*Voy.* no. 72).

686. MONOCONDYLÆA CORRIENTESENSIS, *d'Orb. Voy.* v. 613. t. 68. f. 8–10. B.M.

Argentine Republic; Corrientes; Rio Batel (*Voy.* no. 73).

687. MONOCONDYLÆA GUARAYANA, *d'Orb. Voy.* v. 614. t. 68. f. 4–7. B.M.

Bolivia; Rio de San Miguel (*Voy.* no. 162).

688. MONOCONDYLÆA FOSSICULIFERA, *d'Orb. Voy.* v. 614, t. 80. f. 5–7. B.M.

Argentine Republic; Corrientes; River Parana (*Voy.* no. 69).

689. ANODONTA SIRIONOS, *d'Orb. Voy.* v. 615. t. 74. f. 4–6, t. 80. f. 1–4. B.M.

Var. Anodonta Ferrarsii, *d'Orb.*

Bolivia; Rio de San Miguel (*Voy.* no. 163).
Banda Orientale; Rio del Rosario (*Voy.* no. 62).

Anodonta Ferrarsii, *d'Orb.*

Corrientes; Parana (*Voy.* no. 75); Bolivia; Rio Piray; Santa Cruz (*Voy.* no. 163).

690. ANODONTA TENEBRICOSA, *Lea, d'Orb. Voy.* v. 616. B.M.

Republic of Uruguay; Banda Orientale; Rio de San Jose (*Voy.* no. 65); Buenos Ayres; Rio de la Plata (*Voy.* no. 65).

691. ANODONTA MEMBRANACEA, *d'Orb. Voy.* v. 616. t. 79. f. 11. B.M.

Mytilus membranaceus, *Maton.*
Anodonta lato-marginata, *Lea.*

Republic of Uruguay; Buenos Ayres; Rio de la Plata.

692. ANODONTA SOLENIFORMIS, *d'Orb. Voy.* v. 617. t. 84. f. 1–3. B.M.

Corrientes; Rio Parana (*Voy.* no. 66).

693. ANODONTA ENSIFORMIS, *d'Orb. Voy.* v. 618. t. 79. f. 10. B.M.

Anodon ensiforme, *Spix.*

Bolivia; Rio de San Miguel.

694. ANODONTA TRIGONA, *d'Orb. Voy.* v. 618. B.M.

Anodon trigonum, *Spix.*
Anodon chiquetana, *d'Orb.*

Argentine Republic; Rio Batel (*Voy.* no. 67); Bolivia; Rio de San Miguel; Guarayon (*Voy.* no. 67); Chiquitos (*Voy.* no. 67); Parana; Corrientes (*Voy.* no. 67).

695. ANODONTA TRAPEZEUM, *d'Orb. Voy.* v. 619. B.M.

Anodon trapezium, *Spix.*
Anodon rotundum, *Spix.*

River Parana.

696. ANODONTA LIMNOICA, *d'Orb. Voy.* v. 619. t. 79. f. 1–3. B.M.

Province of Corrientes; Maloya (*Voy.* no. 64).

697. ANODONTA LUCIDA, *d'Orb. Voy.* v. 620. t. 79. f. 4–6. B.M.

Banda Orientale; Rio del Rosario (*Voy.* no. 97).

698. ANODONTA PUELCHANA, *d'Orb. Voy.* v. 620. t. 79. f. 7–9. B.M.

Northern Patagonia; Rio Negro (*Voy.* no. 98).

699. ANODONTA EXOTICA, *Lamk., d'Orb. Voy.* v. 621. B.M.
Anodonta trapezialis, *Lamk.*
Anodonta Patagonica, *Lamk.*
Anodon giganteum, A. anserinum et A. radiatum, *Spix.*
Argentine Republic, river and lakes; Corrientes; Rio Batel (*Voy.* no. 57).

Anodon obtusum, *Spix.*
Anodon Jacobini?
South America (*M. Moricand*).

Anodon littoratum, *Spix* (*Moricand*).
Anodonta rotunda.
Corrientes; Rio Parana (*Voy.* no. 68).

700. BYSSANODONTA PARANENSIS, *d'Orb. Voy.* v. 622. t. 84. f. 21–23.
Argentine Republic; River Parana.

Fam. 6. NUCULIDÆ.

701. NUCULA PUELCHA, *d'Orb. Voy.* v. 624. t. 84. f. 24–26. B.M.
North Patagonia; San Blas (*Voy.* no. 114).

702. NUCULA SEMI-ORNATA, *d'Orb. Voy.* v. 624. t. 84. f. 27–29. B.M.
North Patagonia; San Blas.

703. NUCULA PISUM, *Sow., d'Orb. Voy.* v. 625.
Chili; Valparaiso.

704. NUCULA EXIGUA, *Sow., d'Orb. Voy.* v. 625.
Ecuador; Caraccas.

705. NUCULA GRAYI, *Sow., d'Orb. Voy.* v. 625. B.M.
Nucula obliqua, *Gray*, not *Lamk.*
Chili; Valparaiso.

Fam. 7. ARCACIDÆ.

706. PECTUNCULUS LONGIOR, *Sow.*, *d'Orb. Voy.* v. 627. B.M.

Brazils; Rio de Janeiro (single valves, worn).

707. PECTUNCULUS TELLINÆFORMIS, *Reeve*, *d'Orb. Voy.* v. 627.

Brazils; Rio de Janeiro.

708. PECTUNCULUS INTERMEDIUS, *Brod.*, *d'Orb. Voy.* v. 627. t. 82. f. 26. B.M.

Var.? Pectunculus ovatus, *Brod.*

Peru; Callao (*Voy.* no. 127).

709. PECTUNCULUS MINOR, *d'Orb. Voy.* v. 628.

Pectunculus pectinatus, *Reeve.*

Ecuador; Guayaquil.

710. PECTUNCULUS TESSELLATUS, *Sow.*, *d'Orb. Voy.* v. 628.

Ecuador; Xipixapi.

711. PECTUNCULUS MULTICOSTATUS, *Sow.*, *d'Orb. Voy.* v. 628.

Ecuador; Guayaquil.

712. PECTUNCULUS ASSIMILIS, *Sow.*, *d'Orb. Voy.* v. 628.

Ecuador; Guayaquil.

713. PECTUNCULUS STRIGILLATUS, *Sow.*, *d'Orb. Voy.* v. 628.

Ecuador; Santa Elena.

714. ARCA AMERICANA, *d'Orb. Voy.* v. 632. B.M.

Brazils.

715. ARCA BICOPS, *Philippi, d'Orb. Voy.* v. 632. B.M.
Arca rhombea, var., *Chemn.*
Arca Brasiliana, *Lamk.*, not *Reeve.*
Brazils; Rio de Janeiro.

716. ARCA SOLIDA, *Reeve, d'Orb. Voy.* v. 633.
Byssoarca solida, *Sow.*
Peru; Payta.

717. ARCA PUSILLA, *Sow., d'Orb. Voy.* v. 633. B.M.
Byssoarca pusilla, *Sow.*
Bolivia; Cobija; Peru; Arica.

718. ARCA OBESA, *Sow., d'Orb. Voy.* v. 633.
Peru; Atacama.

719. ARCA LABIATA, *Sow., d'Orb. Voy.* v. 634.
Peru; Tumbez.

720. ARCA LABIOSA, *Sow., d'Orb. Voy.* v. 634.
Peru; Tumbez.

721. ARCA CARDIIFORMIS, *Sow., d'Orb. Voy.* v. 634. B.M.
Arca inequivalvis, *Sow.*, not *Brug.*
Arca Brasiliana, *Reeve*, not *Lamk.*
Peru; Payta.

722. ARCA REVERSA, *Sow., d'Orb. Voy.* v. 635.
Peru; Tumbez.

723. ARCA EMARGINATA, *Sow., d'Orb. Voy.* v. 635.
Peru; Atacama; Ecuador; Xipixapi; Panama.

724. ARCA REEVEANA, *d'Orb. Voy.* v. 635. B.M.
Arca Helblingii, *Reeve*, not *Brug.*
Peru; Payta.

725. ARCA GRADATA, *Sow., d'Orb. Voy.* v. 636.
Ecuador; Santa Elena.

726. ARCA ÆQUATORIALIS, *d'Orb. Voy.* v.636.
Arca ovata, *Reeve*, not *Gmelin.*
Ecuador; Santa Elena.

727. ARCA AVICULOIDES, *Reeve, d'Orb. Voy.* v. 636.
Arca auriculata, *Sow.*, not *Lamk.*
Ecuador; Santa Elena.

728. ARCA SOWERBYI, *d'Orb. Voy.* v. 637. B.M.
Arca biangulata, *Sow.*
Ecuador; Guayaquil.

729. ARCA GRANDIS, *Brod., d'Orb. Voy.* v. 637.
Ecuador; Guayaquil.

730. ARCA LURIDA, *Reeve, d'Orb. Voy.* v. 637.
Byssoarca lurida, *Sow.*
Ecuador; Santa Elena.

731. ARCA NUX, *Sow., d'Orb. Voy.* v. 638.
Ecuador; Xipixapi.

732. ARCA ALTERNATA, *Reeve, d'Orb. Voy.* v. 638.
Byssoarca alternata, *Sow.*
Ecuador.

733. ARCA MUTABILIS, *Reeve, d'Orb. Voy.* v. 638.
Byssoarca mutabilis, *Sow.*
Ecuador.

734. ARCA LITHODOMUS, *Reeve, d'Orb. Voy.* v. 639.
Byssoarca lithodomus, *Sow.*
Lithoarca, *Gray.*
Ecuador; Monte Criste.

735. ARCA PACIFICA, *Reeve, d'Orb. Voy.* v. 639.
Byssoarca pacifica, *Sow.*
Ecuador; Santa Elena.

736. ARCA CEPOIDES, *Reeve, d'Orb. Voy.* v. 639.
Ecuador; San Miguel.

Fam. 8. MYTILIDÆ.

737. PINNA LISTERI, *d'Orb. Voy.* v. 641. t. 85. f. 1. B.M.
Brazils.

738. PINNA PATAGONICA, *d'Orb. Voy.* v. 641. t. 85. f. 2.
Patagonia; Rio Negro.

739. MYTILUS ELONGATUS, *Chemn., d'Orb. Voy.* v. 643. B.M.
Brazils; Rio de Janeiro (*Voy.* no. 35).

740. MYTILUS DARWINIANUS, *d'Orb. Voy.* v. 643. t. 84. f. 30-33. B.M.
Brazils; Rio de Janeiro (*Voy.* no. 34). North Patagonia; Ensemida di Ross (*Voy.* no. 109): (eaten). Patagonia (*Voy.* no. 106).

741. MYTILUS (MODIOLA) GUYANENSIS, *d'Orb. Voy.* v. 644. B.M.
Brazils; Rio de Janeiro (*Voy.* no. 36): (eaten).

742. MYTILUS VIATOR, *d'Orb. Voy.* v. 644. t. 84. f. 33–36.
Patagonia.
This is Mytilus impactus, *Hermann, Naturf.* xvii. 147. t. 3. f. 5–8; xix. 183.
Mytilus Cor, *Martyn.*
Mytilus lanatus, *Calonne, Cat.* 43.

743. MYTILUS DOMINGENSIS, *Lamk., d'Orb. Voy.* v. 645. t. 84. f. 38, 89.
Mytilus exustus, *Lamk.*, not *Linn.*
Brazils; Rio de Janeiro; Cuba and Martinique.

744. MYTILUS FALCATUS, *d'Orb. Voy.* v. 645. t. 84. f. 38, 39. B.M.
Brazils; Rio de Janeiro (*Voy.* no. 37).
Var. spotted. Maldonado?

745. MYTILUS PLATENSIS, *d'Orb. Voy.* v. 645. t. 85. f. 3, 4. B.M.

Mytilus eduliformis, *d'Orb.*, not *Schloth.*

Uruguay; Maldonado; Montevideo, on rocks (bad state).

746. MYTILUS SOLISIANUS, *d'Orb. Voy.* v. 646. t. 85. f. 5–8. B.M.

Maldonado; Entre de la Plata (*Voy.* no. 45).

747. MYTILUS RODRIGUEZII, *d'Orb. Voy.* v. 646. t. 85. f. 9–11. B.M.

Patagonia; Rio Negro and Baie de San Blas.

748. MYTILUS PATAGONICUS, *d'Orb. Voy.* v. 646. t. 85. f. 12, 13. B.M.

Patagonia; Baie de San Blas (*Voy.* no. 104): (eaten).

749. MYTILUS MAGELLANICUS, *Chemn., d'Orb. Voy.* v. 647. B.M.

Patagonia; South of Rio Negro (*Voy.* no. 172).

750. MYTILUS CHORUS, *Molina, d'Orb. Voy.* v. 647. B.M.

Mytilus ungulatus, *Valenc.*, not *Lamk.*

Chili; Concepcion; Peru (young?); Lima (eaten).

751. MYTILUS AMERICANUS, *d'Orb. Voy.* v. 648. B.M.

Peru; Callao; Lima.

752. MYTILUS OVALIS, *Lamk., d'Orb. Voy.* v. 648. B.M.

Peru.

753. MYTILUS GRANULATUS, *Hanley, d'Orb. Voy.* v. 648. B.M.

Chili; Valparaiso (*Voy.* no. 145); Peru; Callao (*Voy.* no. 153).

754. MYTILUS CHENUANUS, *d'Orb. Voy.* v. 649. t. 85. f. 14–16. B.M.

Modiola Chenuanus, *Recluz.*

Peru; Payta (*M. Fontaine*).

755. MYTILUS SOLENIFORMIS, *d'Orb. Voy.* v. 649. t. 85. f. 17, 18. B.M.

Peru; Payta.

Mytilus falcatus is a smooth *Mytilus*.

M. elongatus, M. chorus, M. Patagonicus, M. Platensis, M. Solisianus, M. Darwinianus, M. ovalis, M. Americanus, and *M. granulatus,* are costated *Mytili*.

M. Guyanensis is a smooth *Modiola*.

M. Chenuanus, M. Rodriguezii, and *M. viator,* are costated *Modiolæ*.

M. soleniformis is the type of a new genus.

756. LITHODOMUS PATAGONICUS, *d'Orb. Voy.* v. 650. t. 85. f. 19, 20. B.M.

Patagonia; South of Rio Negro (*Voy.* no. 107) (rock and tube).

757. LITHODOMUS PERUVIANUS, *d'Orb. Voy.* v. 561. B.M.

Peru; Callao; Payta. In coral holes, lined with shelly matter near the mouth.

758. LITHODOMUS INCA, *d'Orb. Voy.* v. 561. B.M.

Peru; Payta.

Lithodomus Peruvianus and *L. Patagonicus* both line the upper part of the cavity they inhabit with a shelly tube. *L. Peruvianus* lives in coral, and *L. Patagonicus* in mud. *L. Inca* scarcely appears to differ from *L. Peruvianus*.

Fam. 9. LIMIDÆ.

759. LIMA ANGULATA, *Sow., d'Orb. Voy.* v. 653.

Ecuador; Caraccas.

760. LIMA PACIFICA, *d'Orb. Voy.* v. 654.

Lima arcuata, *Sow.*, not *Geinitz.*

Ecuador, Guayaquil, and Panama.

Order II. PLEUROCONQUES.

Fam. 1. AVICULIDÆ.

761. AVICULA SQUAMULOSA, *Lamk., d'Orb. Voy.* v. 658. B.M.
Mytilus margaritiferus, *pars, Gmelin.*
Brazils; Rio de Janeiro (*Voy.* no. 33).

*AVICULA. B.M.
Peru; Payta (*M. Fontaine,* no. 86).

Fam. 2. PECTINIDÆ.

762. PECTEN TEHUELCHUS, *d'Orb. Voy.* v. 662. t. 85. f. 21–24. B.M.
Patagonia, between Rio Negro and Bahia de San Blas (*Voy.* no. 139).

763. PECTEN PATAGONICUS, *King, d'Orb. Voy.* v. 662.
Maghellan Straits (*King*).

764. PECTEN PURPURATUS, *Lamk., d'Orb. Voy.* v. 663. B.M.
Peru; Callao.

765. PECTEN TUMBEZENSIS, *d'Orb. Voy.* v. 663.
Pecten aspersus, *Sow.*, not *Lamk.*
Peru; Tumbez.

766. PECTEN INCA, *d'Orb. Voy.* v. 663. B.M.
Pecten tumidus, *Sow.*, not *Zieten.*
Peru; Payta.

767. PECTEN MAGNIFICUS, *Sow., d'Orb. Voy.* v. 664.
Ecuador; Isle de la Plata.

768. JANIRA DENTATA, *d'Orb. Voy.* v. 666.
Pecten dentatus, *Sow.*
Ecuador; Santa Elena.

769. SPONDYLUS PRINCEPS, *Brod., d'Orb. Voy.* v. 667. B.M.
Ecuador; Isle de la Plata.

770. SPONDYLUS LEUCACANTHA, *Brod., d'Orb. Voy.* v. 668.
Ecuador; Isle de la Plata (var. of preceding?).

771. PLICATULA BARBADENSIS, *d'Orb. Voy.* v. 669.
Spondylus Barbadensis, *Petiver.*
Spondylus plicatus, *Chemn.*
Plicatula ramosa, P. depressa, P. reniformis, and P. cristata, *Lamk.*
Brazils. Var. (smaller) Patagonia.

Fam. 3. CHAMACIDÆ.

772. CHAMA PELLUCIDA, *Brod., d'Orb. Voy.* v. 670. B.M.
Bolivia; Cobija (*Voy.* no. 154); Mexillones (18 fathoms, mud).

773. CHAMA FRONDOSA, *Brod., d'Orb. Voy.* v. 671.
Ecuador; Isle de la Plata.

CHAMA. B.M.
Peru; Payta (*M. Fontaine*).

Fam. 4. OSTRACIDÆ.

774. OSTREA SPRETA, *d'Orb. Voy.* v. 672. B.M.
Brazils; Rio de Janeiro.

775. OSTREA PUELCHANA, *d'Orb. Voy.* v. 672. t. 85. f. 25, 26, B.M.
Patagonia; Baie de San Blas; Brazils.

776. OSTREA ÆQUATORIALIS, *d'Orb. Voy.* v. 672. B.M.
Ecuador; Guayaquil; Isle de la Luna.

Ostrea spreta is subplicate; *O. Puelchana* and *O. Æquatorialis* are smooth, and probably varieties of the same species, varying in form according to the substance on which they are attached: some specimens of the latter have elongated, and others short, broad muscular scars, like *O. Puelchana*.

777. ANOMIA PERUVIANA, *d'Orb. Voy.* v. 673. B.M.
Peru; Payta.

The three muscular scars of the upper valve are nearly equal in size; the two lower ones are equal, very near together, almost confluent.

778. PLACUNOMIA FOLIACEA, *Brod., d'Orb. Voy.* v. 674.
Ecuador; Guayaquil.

Order III. PALLIOBRANCHES.

779. TEREBRATULA MALOUINÆ, *d'Orb. Voy.* v. 674. t. 85. f. 27–29.
Isles Malouines.

780. TEREBRATULA DORSATA, *Lamk., d'Orb. Voy.* v. 675.
Straits of Maghellan.

781. TEREBRATULA ROSEA, *Mawe, d'Orb. Voy.* v. 675.
Brazils.

782. TEREBRATULA FONTAINEI, *d'Orb. Voy.* v. 675.
Terebratula Chilensis, *d'Orb.*
Chili; Coquimbo.

783. TEREBRATULA CHILENSIS, *Brod., d'Orb. Voy.* v. 676. B.M.
Chili; Coquimbo (bad state).

784. LINGULA SEMEN, *Brod., d'Orb. Voy.* v. 676.
Ecuador; Guayaquil.

785. ORBICULA LAMELLATA, *Brod., d'Orb. Voy.* v. 677. B.M.
Peru; Callao (large groups of many specimens).

786. ORBICULA CUMINGII, *Brod., d'Orb. Voy.* v. 677.
Peru; Payta; Ecuador; Santa Elena.

CORRECTION.

Page 10. 97. HELIX CHEILOSTROPHA, *add* B.M.

Printed by Taylor and Francis, Red Lion Court, Fleet Street.

CATALOGUES

OF

THE ZOOLOGICAL COLLECTION

IN

THE BRITISH MUSEUM.

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List of Mammalia. By Dr. J. E. GRAY, F.R.S. &c. 1843. 2*s*.6*d*.

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N.B.—These Catalogues can be obtained at the Secretary's Office in the BRITISH MUSEUM; of Messrs. LONGMAN & Co.; or of any Bookseller.

June 1853.

CATALOGUE

OF THE COLLECTION OF

MAZATLAN SHELLS,

IN THE

BRITISH MUSEUM:

COLLECTED BY

FREDERICK REIGEN.

DESCRIBED BY

PHILIP P. CARPENTER.

LONDON:
PRINTED BY ORDER OF THE TRUSTEES.
1857.

PRINTED BY P. P. CARPENTER, OBERLIN PRESS, WARRINGTON.

PREFACE.

"The Collection, from which the shells described in the following pages have been carefully selected, was made at Mazatlan, (*lat.* 23° N., *long.* 107° W.) during the years 1848-50, by a Belgian gentleman named Frederick Reigen." The bulk of that portion of it quoted in the following pages as the 'Liverpool Collection,' was purchased by Herbert Thomas, Esq., of Bristol, and Mr. P. P. Carpenter. The latter gentleman "selected from it as many specimens as might be required (1) to illustrate the local-fauna of a known station at the mouth of the Gulf of California; and (2) to exhibit the amount of variation, whether great or little, observed in comparing together large numbers of individuals in the various species. The latter object appeared of no slight importance, especially for the sake of inland naturalists; who have usually to depend on the very limited number of specimens which are generally to be seen both in public and in private collections."

This series Mr. Carpenter presented to the British Museum, on the understanding that it should be kept separate and intact for the purposes above named, like the Cuban, South American, and other local collections: he undertaking, at the same time, to prepare a Descriptive Catalogue, which is here printed. The descriptions of the Bryozoa, occupying the first six pages, were kindly communicated by G. Busk, Esq. F. R. S., &c.

"The collection consists of about 8873 specimens (2505 Bivalves, &c., and 6368 Univalves) mounted on 2530 glass tablets. The number to the left refers to the *species*, that to the right to the *tablet* in the Catalogue. The minute specimens are fastened on strips of thin glass enclosed in test tubes. By this mode of arrangement, both sides of the object can be seen without disturbance."

"The measurements (unless otherwise expressed) are thus taken. In the bivalves; *long.* from the umbo to the *middle* of the ventral margin; *lat.* from the anterior to the posterior ends; *alt.* the thickness of the closed valves. In the spiral univalves; *long.* from the vertex to the base; *long. spir.* from

the vertex to the posterior end of the labrum; *lat.* the diameter of the body whirl; *div.* the mean angle of divergence of the spire outlines. All the measurements of length are given in inches and decimal portions."

"In describing the sculpture of bivalves, *concentric* signifies, in the direction of layers of growth; *radiating*, from the umbo to the margin. In the spiral univalves; *radiating* (from the axis of the shell), in the direction of layers of growth; *spiral*, along the whirl, parallel to the suture. In comparing the words used to describe sculpture (liræ, lirulæ, striæ, striulæ, &c.) with the same words in other books, they should often be interpreted as to the appearance of the shell under the microscope, generally with an inch-achromatic. The *vertex* applies to the whole nuclear portion; but the *apex* only to the first whirl. As a slight twist in this may, or may not, be estimated as a whole turn, the number of whirls, as stated by different authors for the same shell, may sometimes vary."*

"The terms expressing frequency are generally used as follows: *extremely rare*, under a score; *very rare*, under 100; *rare*, under 200; *not common* or *not uncommon*, 300; *common*, up to 400 or 500; *abundant*, about 600 or 700: *extremely common*, up to 1,000; *extremely abundant*, more than 1,000."

"In citing geographical authorites, the name of the first observer is distinguished by *Italics*. The mark of uncertainty [?], is to be understood as always referring to what *follows*, and not to the word going before."

"An estimate of the value of the Reigen Collection as a geographical authority, and a comparison of it with other neighbouring faunas, will be found in the 'Report of the present state of our knowledge of the Mollusca of the West Coast of N. America,' presented to the British Association in Sept. 1856, and published in its Transactions, pp. 159—368."

JOHN EDWARD GRAY.

British Museum: April 22nd, 1857.

* "This may account for discrepancies in Vitrinella, and in the descriptions of the nuclear vertex in Pyramidellidæ. In this Catalogue, the number is over rather than under-rated."

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CATALOGUE

OF

MAZATLAN MOLLUSCA.

CLASS BRYOZOA. *Ehr.*

Bryozoa; *Ehrenberg, Corall. des Roth. Meeres*, 153.—*Jones An. Kingd.* 107—117.—*Owen Lect.* 93—101.—*Audouin & Milne-Edwards* in *Lam. An. s. Vert.* ii. 104, 2de ed.—*Carpenter Princ. Comp. Phys.* ed. iv. pp. 50—58.

Polyzoa, *J. V. Thompson, Zool. Res. Mem.* v. 92.—*J. E. Gray* in *Syn. B. M.* 133.—*Johnston's Br. Zooph.*, i. p. 253, ed. 2: v. note, p. 254.—*Busk* in *Ann. Nat. Hist.* 2nd Ser. vol. 10. p. 362.

Molluscan Zoophytes s. Zoophyta Ascidioida, *Johnst.* in *Mag. Zool. & Bot.* i. 448.

Ciliobrachiata, *Farre* in *Phil. Trans.* 1837.

Polypes tuniciens, *M. Edw.* Mem. 16.

Order I. BRYOZOA INFUNDIBULATA.

P. Gervais in *Ann. des Sc. Nat.* vii. 79.—*Johnst. Br. Zooph.* i. 255.

Suborder I. CHEILOSTOMATA.

Family MEMBRANIPORIDÆ.

Membraniporidæ, *Busk, B. M. Cat.* p. 55.

Genus MEMBRANIPORA, *Blainv.*

Membranipora, *Busk, B. M. Cat.* p. 56.

1. Membranipora denticulata; *Busk, (n. s.)*

Areis cellularum rhomboideis; aperturâ interiori margine denticulato.

The outline of the cells is usually distinctly defined by a narrow brown line. One or two rounded or triangular eminences (probably ovicells,) are visible on many of the cells in front

and below. This form bears considerable resemblance to Membranipora Savartii (*Savigny, Egypt*, pl. 10; M. Lacroixii. *B. M. Cat.* p. 60, pl. 104, fig. 1.): but differs from it in several important respects; among which may be noticed the narrow brown line surrounding the cells and clearly defining one from the other; and the irregularly shaped branching denticles with which the margin of the interior calcareous aperture is furnished.

Hab.—Mazatlan; on the shells of Imperator olivaceus, Imp. unguis and Anomia; *Liverpool Collection.*

Tablet 1 contains a group on Imperator.

2. MEMBRANIPORA GOTHICA, *Rylands, ms. (n. s.)*

Areis cellularum elongatis, ovalibus; margine glabro, tenui; ore elevato, suborbiculari, inferne late sinuato; cellularum superficie anteriori calcareâ depressâ, punctatâ, orificio magno utrinque perforato; avicularii magnis, immersis, irregulariter per polyzoarium sparsis.

There is occasionally a short blunt spine or process on each side of the mouth, a character which also exists in M. Rozieri, *Savigny, (B. M. Cat.* p. 59, pl. 65, fig. 6,) a species to which the present exhibits in other respects considerable resemblance, and especially in the existence of the large opening on each side of the front of the cell immediately below the mouth. The differences between the two, however, are sufficiently striking. In M. Rozieri the ovicell is large, superior, rounded, and carinate in front; whilst in M. gothica, as in M. calpensis, *Busk*, &c. this organ appears to be represented by one or two rounded eminences at the bottom of the cell in front. The large scattered avicularia also, are characteristic of the present form, as well as its much larger size.

The same species occurs on a pearl-oyster shell, for which I am indebted to Dr. J. E. Gray; the habitat assigned to which is doubtfully given as the Persian Gulf. In M. M. Edwards' Memoir *Sur les Escharæ*, p. 17, pl. 12, fig. 13, a miocene fossil is described and figured, which bears considerable resemblance to the present; it differs principally, so far as can be determined from the figure alone, in the thickened and granulated margin of the area.

Hab.—Mazatlan: on Imperator olivaceus and unguis; *L'pool Col.*

Tablet 2 contains a group on Imperator.—3, a group detached.

GENUS LEPRALIA, *Johnston.*

Lepralia, *B. M. Cat.* p. 63.

3. LEPRALIA ATROFUSCA, *Rylands, ms. (n. s.)*

Cellulis elongatis, ovatis seu rhomboideis, lineâ tenui elevatâ cinctis, superficie punctato; ore suborbiculari, inferne sinuato, utrinque denticulato.

General hue, blackish; and even when the cells are more calcareous and on that account whiter, the dark interstitial line remains very evident. It is quite distinct from L. cucullata, (*B. M. Cat.* p. 81, pl. 96, fig. 4, 5,) also of a black colour, and which occurs in the Mediterranean.

Hab.—Mazatlan; on Imperator olivaceus and unguis, and on Anomia; *L'pool Col.*

Tablet 4 contains 2 groups detached.

4. LEPRALIA TRISPINOSA, *Johnst.*

B. M. Cat. p. 70, pl. 85; fig. 1, 2; pl. 98; pl. 102. fig. 2.—*Johns. Br. Zooph.* i. 324, ed. 2; pl. 57, f. 7.—*Couch Corn. Faun.* iii. 118.—*J. Macgillivray* in *Ann. & Mag. N. Hist.* ix. 467.

Discopora trispinosa, *Johns.* in *Ed. Phil. Journ.* xiii. 322.

Bercnicea trispinosa, *Johns.* in *Trans. Newc. Soc.* ii. 268.

A single minute specimen only has occurred to my notice, but this is quite indistinguishable from the British form.

Hab.—On shells from deep water, rare, Berwick Bay, *Johnston.* Coast of Cornwall, *Peach.*—On root of Laminaria digitata, near Aberdeen, *Macgillivray.*—Mazatlan; on Imperator; *L'pool Col.*

Tablet 5 contains the group.

5. LEPRALIA MAZATLANICA, *Busk. (n. s.)*

Cellulis immersis, depressis, seu ventricoso-globosis; superficie punctato; ore suborbiculari inferne late sinuato; margine incrassato, elevato; avicularia unico (vel rare, duobus) laterali prope os.

This form might easily be confounded with some varieties of L. unicornis, or L. Ballii. It is distinguished, however, by its reddish colour, and the elevation of the mouth together with its thickened margin. The single or sometimes double avicularium points outwards and upwards, and the mandible is prolonged and acute. It is sometimes, but not frequently absent.

Hab.—Mazatlan; on Imp. olivaceus and unguis; *L'pool Col.*

Tablet 6 contains a group on Imperator.—7, one detached.

6. LEPRALIA ROSTRATA, *Busk, (n. s.)*

Cellulis immersis, superficie tuberculatâ seu granulatâ; ore immerso, margine superiori inconspicuo; margine inferiori profunde sulcato; avicularia magno, sessili, armato.

The lower or interior margin of the mouth in the fully formed cells, is deeply grooved in the middle; and on one side of the sulcus is a strong, short, blunt, spinous process; on the other a comparatively large raised avicularium, which faces towards the sulcus, and whose mandible is acute and points upwards and outwards. The surface of the cell is often beset with short raised spines or processes; and these, projecting over the mouth of the cell below, give it the appearance of being furnished with several oral spines.

Hab.—Mazatlan; on Imperator unguis; *L'pool Col.*

Tablet 8 contains a group on Imperator.—9, one on base of do.

7. LEPRALIA MARGINIPORA, *Reuss.*

Fossil Polyp. d. Wiener Tertiar. Beck. p. 88, pl. 10, fig. 23.

Cellulis ovatis, convexis seu subdepressis, immersis, asperulis, margine punctatis; ore rotundo seu subelliptico; margine subincrassato, singulo latere avicularium gerente.

As the form appears precisely to resemble the tertiary species described and figured by Reuss, I have applied his name, and in great part employed his character.

Hab.—Mazatlan; on Imperator unguis; *L'pool Col.*—*Fossil*, Vienna.

Tablet 10 contains a group on Imperator.

8. LEPRALIA HIPPOCREPIS, *Busk, (n. s.)*

Cellulis immersis, superficie punctatis; ore suborbiculari seu elliptico; margine superiori cellularum natu majorum, inconspicuo, inferiori et laterali incrassato utrinque avicularium gerente.

The peculiarly horse-shoe shaped mouth of the older cells, sufficiently distinguishes the present from the preceding species, to which, in the mouth alone of the younger cells, it bears some resemblance.

Hab.—Mazatlan; on Imperator olivaceus; *L'pool Col.*

Tablet 11 contains a group on Imperator.

9. LEPRALIA HUMILIS, *Busk, (n. s.)*

Cellulis immersis, depressis seu complanatis, superficie obscure punctatis; ore parvo rotundato, inferne subsinuato; margine simplici, tenui.

Hab.—Mazatlan; on Imperator unguis; *L'pool Col.*

Tablet 12 contains a group on Imperator.

10. LEPRALIA ADPRESSA, *Busk.*

Busk in *B. M. Cat.* p. 82.

The Mazatlan form differs from that from Chiloe in the absence or indistinctness of the radiating grooves. The mouth and shape of the cell agree perfectly.

Hab.—Chiloe, 96 fm. on shell, *Darwin.*—Mazatlan; on Columbella major, C. fuscata, and Pisania gemmata, not uncommon; *L'pool Col.*

Tablet 13 contains a group on Columbella.

FAMILY II. CELLEPORIDÆ.

Busk, B. M. Cat. p. 85.

GENUS CELLEPORA, *O. Fabr.*

Busk, B. M. Cat. p. 85.

11. CELLEPORA PAPILLÆFORMIS, *Busk, (n. s.)*

Cellulis sub-hexagonis, elevatis, superficie punctato; ore subrotundato utrinque denticulato; margine simplici, tenui, avicularii sparsis, mandibulo triangulari.

A well marked and distinct form, belonging to that subdivision of Cellepora in which the mouth is not armed with a projecting avicularium. The top of each cell projects in the form of a rounded mamillary eminence from a hexagonal area which defines the border of the cell. The cells are of very unequal sizes, and very irregularly disposed. It is of a brownish colour.

Hab.—Mazatlan; on Imperator olivaceus; *L'pool Col.*

Tablet 14 contains a group on Imperator.

12. CELLEPORA CYCLOSTOMA, *Busk. (n. s.)*

Cellulis suberectis, seu decumbentibus, discretis, superficie punctato; ore magno superne rotundato, inferne late sinuato; cellularum natu majorum margine valde elevato, incrassato, subinde dilatato, infundibuliformi, utrinque avicularium parvum gerente.

The wide, rounded or elliptical raised margin of the mouths of the distant cells gives the polyzoarium of the present species a very peculiar and well marked aspect. It is of a brownish hue, or white.

Hab.—Mazatlan; on Imperator unguis; *L'pool Col.*

Tablet 15 contains a group on Imperator.—16, a group detached.

Suborder II. CYCLOSTOMATA.

FAMILY DISCOPORADÆ. *Busk, (ms.)*

Genus DEFRANCIA, *Bronn.*

13. Defrancia intricata, *Busk, (n. s.)*

Disco valdè irregulari; irregulariter radiatim costulato; orificiis tubulorum, porisque interstitialibus æqualibus magnitudine.

The small irregular patches appear to be constituted by the confluence of several sets of costæ with their corresponding interstices, each set radiating from a depressed central point. It differs from D. deformis *Reuss*, (L. c. p. 36, pl. 5, f. 24,) in the uniform size of the openings of the tubes in the costæ and of the pores in the insterstices.

Hab.—Mazatlan; on Imperator unguis; *L'pool Col.*

Tablet 17 contains a group on Imperator.

Besides the above, there occur on some of the shells, indications of other species, but in too imperfect a condition to allow of their determination. Among these perhaps the best marked is a species strongly resembling Cellepora pumicosa, *Lin.*, a species of Lepralia, and of Tubulipora.

CLASS TUNICATA.

Omnia adhuc ignota.

CLASS PALLIOBRANCHIATA, *Blainv.*

Brachiopoda, *Cuv.* Brachiopoda and Rudista (pars) *Lam.*
Palliobranchiata, *Blainv.*

Family DISCINIDÆ.

Genus DISCINA, *Lam.*

Discina, *Lam.*
Orbicula, *Sow.* not *Cuv.* or *Lam.*

14. Discina Cumingii, *Brod.*

Orbicula Cumingii, *Brod.* in *Proc. Zool. Soc.* 1833, p. 125.—*Brod.* in *Trans. Zool. Soc.* i. 143, pl. 23. f. 1.—*Müll. Syn. Test. Viv.* p. 175.—*Lam. An. sans Vert. Desh.* ed. tert. iii. pt. i. p. 118. no. 3.—*Sow. Thes. Conch.* p. 366. no. 4. pl. 73. f. 6.—*D'Orb. Voy. Amer. Merid. Moll.* p. 677.—*B. M. Cat.* of *D'Orb. Shells*, no. 786, p. 89.

Discina Cumingii, *Davidson's Class. of Brach.* in *Brit. Eos. Brach.* vol. i. p. 129.

This shell is the Pacific analogue of D. striata, which probably belongs to the Atlantic. Some specimens of each species are hard to distinguish from the other. D. Cumingii varies greatly in form, according to the place of its attachment, and is often extremely thin, and scarcely shelly. This is always the case with the lower valve, which has its disk of attachment subterminal, covered with a thin skin except at a very small chink. The upper valve is generally smooth near the apex, which is occasionally subcentral, afterwards closely set with radiating striæ, more or less developed, and generally (not always) decussated by slightly raised lines of growth. Sometimes nearly the whole of the upper valve is smooth and thin, as in lævis. The lower valve generally displays only the concentric lines of growth, but is occasionally decussated near the edge. It is sometimes so convex as to allow scarcely any space for the animal. Muscular impressions not so strongly marked as in D. striata. The young shells are often fringed round the edge, (with the remains of the cilia, *Brod.*) Colour, brownish yellow. The largest valve measures, *long.* ·47, *alt.* ·08 *in.*

Hab.—Payta (Peru), St. Elena, Panama, attached to lower sides of stones in sandy mud at low water—6 fm.: *Cuming.*—Payta, Ecuador, St. Elena, *D'Orbigny.*—Seas of Chili [?] and Peru, Deshayes.—Panama, common, under stones at low water, *C. B. Adams:* Mazatlan; on Ostrea iridescens and Virginica, Chamæ, Pinnæ, Spondylus Lamarckii, Strombus galea, in umbilical chink of Vitularia salebrosa; rare, *L'pool & Havre Coll.*

Tablet 18 contains 8 valves, very young, in test tube.—Tablet 19 contains 4 adult valves.—Tablet 20 contains Ostrea Virginica, with Chama ? spinosa attached, and 3 fine specimens of D. Cumingii in situ. One is removed from its nestling place between the Chama and Oyster, and laid open to shew the inside.

CLASS LAMELLIBRANCHIATA, *Blainv.*

Conchifera: *Lam. Phil. Zool.* 1809; *An's. Vert.* v. 411, ed. 2, vi. 1.—*Gray, Syn. B. M.* 1840, 1842, p. 72; *Proc. Zool. Soc.* 1848, p. 183.

Acephala Lamellibranchiata: *Rang, Man. Moll.* 272.—*Forbes and Hanl. Br. Mol.* i. 55.—*Clark, Moll. Test. Mar. Br.* 23.

Family PHOLADIDÆ.

Pholadidæ, *Gray, P. Z. S.*

Genus PHOLADIDEA, *Turt.*

Pholas, *Lin. Lam.*

15. Pholadidea melanura, *Sow.*

Pholas melanura, *Proc. Zool. Soc.* 1834, p. 70.—*Sow. Thes. Conch.* 1849, p. 499.—*B. M. Cat. D'Orb. Shells*, no. 479, p. 56.

This belongs to the same group of species as tridens, quadra, spathatula, and concamerata, which last represents it on the Californian coast. In its posterior cup-like appendages, it resembles Talona clausa from the Gambia. The shell is extremely thin, shewing inside a row of oblong tubercles impressed from without on the line separating the anterior and posterior portions, as well as the anterior ridges. These are closely set, strong, and waving; and passing over the medial depression at an angle slightly widening as the shell becomes adult, are continued, concentric and straight, gradually fading as they approach the posterior extremity. This is covered with a thick epidermis, ending in a short double cup, which is bi-lobed outside and simple within. The adult closing of the valves is carried in a flat expansion round to the umbos. The largest specimen measures, with the cup, *long.* 9, *lat.* 1·85, *alt.* 8·6.

Hab.—In hard clay and loose stones at low water, Monte Christi (Guayaquil), *Cuming.*—Ecuador, Monte Christi, *D'Orbigny.*—Mazatlan; in company with *P. acuminata*, extremely rare; *L'pool Col.*

Tablet 21 contains the most characteristic (though a somewhat imperfect) specimen.

16. PHOLADIDEA ? CURTA, *Sow.*

Pholas curta, *Proc. Zool. Soc.* 1834, p. 71.—*B. M. Cat. D'Orb. Shells*, no. 482, p. 56.

The only two specimens found are too imperfect to identify with accuracy. Though very small, they are both adult, and are known at once from the young of *melanura* by the extreme fineness of the anterior waved striæ, the posterior part scarcely shewing more than lines of growth. Dorsal plate shield-shaped, in two layers, hollow within, rather large and regular. *Long.* ·28, *lat.* ·34; shield ·17 by ·15.

Hab.—Isle of Lions, Veragua, in soft stone at low water, *Cuming.*—Ecuador: Isle de los Leones, [?] *D'Orbigny.*—Mazatlan, in Strombus galea, *Havre Col.*

Tablet 22 contains 1 valve (the other being broken in extraction) with its plate.

GENUS PARAPHOLAS, *Conr.*

Parapholas, *Conrad.* sp.

This genus, including Californica, Incii (Torres Str.), branchiata, calva, (acuminata,) and bisulcata (Woodw.) differs from Martesia (Leach) in having its cup laminæ persistent and underlapping one another. It further differs from *Pholadidea* in the large size of the umbonal plate, and the gaping in the ventral and dorsal margins, closed by plates in the adult shell. All yet known are from the Pacific. The Californian species is of large size, and makes a shelly tube for its siphons.

17. PARAPHOLAS CALVA, *Gray, ms.*

Pholas calva *Sow.* in *Proc. Zool. Soc.* 1834, p. 69.—*Thes. Conch.* 1849, p. 493.

Animal excavating a pear-shaped burrow in shell (or stone) which is perfectly smooth and circular transversely, so that the shell (till it becomes adult) can move freely round in it. The orifice is subcircular, and rather large. As the animal continues its boring deeper, the swollen anterior portion becoming now posterior and therefore too large for the animal, which loves to have just room enough and no more, the vacant space is filled up with a lining (more or less thick according to the depth of the burrow) which is not an organic growth from the mantle, but appears to be nothing more than a sedimentary deposit in layers. Whether the burrow is in the purple or white portion of the Spondylus, the deposit is always dark grey. It may be detached as a tube from the cavity, and is often per-

forated by other borers. The deposit is rarely seen in young shells, but is common in adolescent and ? universal in old specimens. At the bottom of the burrow is generally seen an irregular mark projecting beyond the smooth surface of the hole, formed by the ? foot of the animal. Sometimes this is only a "scar, strongly resembling an irregular oval muscular impression with an elevated marginal ridge from which it sinks back to a deep central linear depression, the whole strongly marked with concentric and radiating furrows." *(Darbishire)*. More often there is a sort of side chamber, or shoe, irregularly excavated in the shelly matrix, and not always in the same relative position, the surface of which is warty and very irregularly corrugated. This is generally filled with a black horny substance, giving an animal smell when burnt, but not displaying any silicious particles. In very old specimens this excavation is often enormously developed, occasionally reaching up between the grey deposit and the shelly matrix. Even in rather young shells this foot-chink is sometimes seen; and whenever the burrow reaches the inside of the Spondylus, the black substance is always first apparent. ? Does the foot make this lodgment as a fulcrum, while the valves spin round and form the burrow: and after the adult valves can no longer move, ? does the foot amuse itself with forming these superfluous excavations.

Shell, when extremely young, of xylophagoid shape, with the ventral portion undeveloped and the cup-laminæ only existing as slight folds of the epidermis. Soon however two radiating lines become developed, and the ventral part rapidly increases. Throughout the younger portion of its life there is a very large dorsal as well as ventral gape. The anterior edge is marvelously thickened, ending in a stout knob, quite capable of aiding in boring execution. In the single specimen found in a transition state, this knob is no longer prominent, and the anterior gape is partially filled with shell, not smooth as in the adult, but gradually carrying off the ribs of the thicker portion.

Adult shell squarish or rounded anteriorly, short or lengthened, presenting all the intermediate forms between calva and acuminata of *Sow.*; fitting so tightly into its burrow that when dried it is often impossible to remove it without fracture, the umbonal plate being firmly adherent to the matrix. The epidermis is thin on the anterior part; over the ventral part, folded in thick concentric layers, every 4 or 5 of which (varying in number) are as it were joined together along the posterior line into a series of tiles; and thence continued in a series of over-

lapping horny laminæ over the posterior portion. The snout is nearly round outside, displaying the gaping ends of the valves within, and a bi-partite lamina, rather rugose, between the two. The margin is entirely closed (except at the anterior part) with thick horny epidermis, strengthened ventrally by a long, narrow plate, not only filling up the gape of the young shell but projecting beyond the knob (now absorbed) into the anterior portion; smooth, with a faint line in the middle: and dorsally by a thicker plate, with rather rounded projecting edges more or less swollen towards the umbos. These, with about a third of the surface of the valves, are covered with an irregularly shaped shield, smooth externally, encircling part of the dorsal plate, and with an internal, bi-partite, anterior lamina, fitting the valves. Between this shield and the hinge there is vacant room, but there appears no place of exit for the foot except at a very slight anterior chink, which seem to be all that the stretching power of the integuments can allow. The markings within vary considerably, the thick anterior ridge being often quite absorbed, and the hinge apophyses irregular.

See a very full account of the animals of British Pholadidæ, and the relations between lamellata and papyracea of Turton, in *Clark's Moll. Test. Mar. Brit.* p. 169—212.*

The following are measures of different specimens:—*

	Long.	*Lat.*	*Alt.*
Largest (acuminate)	·99	1·93	·98
Shorter form	·81	1·45	·78
Smallest adult	·35	·67	·34
Smallest jun.	·04	·06	?·04

Hab.—Adult in Spondyli, 12 fm., Isle of Perico in Panama Bay; jun. in hard stones at low water, *id.*;† *Cuming.*—Mazatlan: abundant in Spondylus Lamarckii: also in ?primitive (not limestone) rock to which the Spondyli are attached; 2 young specimens in Chamæ, and 1 in Strombus galea: *L'pool & Havre Coll.*

Tablet 23 contains 8 valves very young.—24, 9 young specimens varying in size and acumination.—25, a young specimen with a part of its own burrow, in the tooth of a Spondylus,

* In this family, and in Gastrochænidæ, the length was measured straight across, not to the middle of the ventral margin.

† This is the accurate statement in the Proc. Z. S.: in the Thes. Conch., it is given as "collected by Mr. Cuming in very hard stone at low water in Panama Bay;" making it appear that all the specimens were thus collected, whereas the adults were found in Spondyli, 12 fm. deep. Similarly careless transcripts are not uncommon in the Monographs.

shewing the grey lining and part of the pedal chink.—26, the adolescent specimen.—27, 6 adult specimens shewing various peculiarities of growth.—28, a small adult specimen in situ, with a thick irregular lining: another specimen remains entombed.—29, an adult with part of its burrow, shewing the stratified nature of the lining: the anterior portion of the shield curiously deformed.—30, a piece of Spondylus, with 3 young specimens in situ, and several burrows, shewing the stratified lining, and the pedal excavations reaching the inside of the shell, to the evident annoyance of the Spondylus, which has protected itself against one of its enemies by a protuberance ·7 across, and ·23 high.—31, a large piece of Spondylus with various burrows: a large one of calva, with enormous foot chink: a smaller one in the hinge tooth: two others with small foot marks: a burrow of ?Lithodomus encased from an old hole into which it had penetrated: a singularly twisted burrow of Gastrochæna, bent nearly double, &c.—32, fragments of the horny ?foot.—33, fragments of the grey deposit.—34, fragments shewing hinge structure.—35, fragments illustrating the cup-laminæ.—36, portions of the umbonal plate.—37, portions of the dorsal and ventral plates.

18. PARAPHOLAS ACUMINATA, *Sow.*

Pholas acuminata, *Proc. Zool. Soc.* 1834, p. 70.—*Sow. Thes. Conch.* 1849, p. 492.

The author of this species distinguishes it from calva by the shape of the laminæ and posterior portion, which are variable in both forms; and by the character of the umbonal shield. This last is the only constant character of difference. It is not only smaller, not projecting beyond the dorsal plate; (which is not the result of age, being found in all the specimens;) but, in all the specimens allowing of observation, it is turned-in all round, instead of at the anterior portion only as in calva. The external surface also is generally rougher, and the posterior gape smaller, not displaying the bipartite laminæ so clearly. Still, as the shells exactly agree in all other respects, it is probable that these differences only result from changes in situation. All the calvæ were taken out of Spondylus: all the acuminatæ were sent loose; and from their extremely perfect condition were probably extracted from clay or wood. If the latter, the irregularities of the decaying timber might cause the roughening of the plate-surface. The original specimens of acuminata however were taken out of argillaceous limestone. The largest specimen measures *long.* ·8, *lat.* 1·54, *alt.* ·77.

Hab.—Panama, in limestone rocks at low water, *Cuming.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 38 contains 3 normal specimens.—39, 3 do. distorted.—40, 2 do. shewing inside, and plates.

Genus MARTESIA, *Leach.*

Differing from Pholadidea in the large development of the accessory plates; from Parapholas in the cups not being persistent.

19. Martesia intercalata, *n. s.*

M. t. parvâ, subglobosâ, in duas partes divisâ; parte anteriore tenuissime concentrice striatâ, radiis longitudinalibus subobsoletis vix undatâ; in juniore maxime hiante, margine solido; in adultâ secretione semi-corneâ clausâ; parte posticâ sublævi, epidermide copiose indutâ, margine rotundato; umbonibus testâ reflexâ adhærente cœlatis; clypeo pyriforme, parvo, solido, inter secretiones valvarum intercalante; partibus ventrali et dorsali laminis semi-corneis, brevibus, a calyce repulsis; calyce plano, brevi, simplici, extante.

The species is named from the remarkable way in which the umbonal shield pushes itself in anteriorly between the projecting portions of the closed valves; and in which the cup, which pouts out from the otherwise rounded extremity, pushes itself in between the anterior and posterior plates, cleaving them and thrusting them back. Mr. Hanley was fortunate enough to find two specimens burrowing in Spondylus, of which the larger has not yet closed the anterior portion, but the smaller is adult. The shield does not fold round the dorsal plate. The whole dorsal and posterior part has a thickened raised margin, probably epidermal. The largest (adolescent) specimen measures *long.* ·34, *lat.* ·35, *alt.* ·33. The cup in the smaller specimen measures ·06.

Hab.—Mazatlan; in Spondylus Lamarckii, extremely rare; *Havre Col.*

Tablet 41 contains various magnified sketches of the two specimens in Mr. Hanley's collection.

20. ———, ———.

A curious little fragment, unfortunately too imperfect for identification, which may belong to a Pholad, but is certainly distinct from any of the foregoing. Shell with a strong, irre-

gularly curved tooth, deeply channeled on the convex side, appressed to the umbo and projecting considerably above the margin of the valve. No process on the hinge as in Pholas, and apparently with groove for external ligament. Outside oval, smooth near umbo, afterwards with slight concentric rounded ribs and very slight radiating furrows.

Tablet 42 contains the fragment, and a magnified sketch.

Family GASTROCHÆNIDÆ.

Genus GASTROCHÆNA, *Spengler.*

21. Gastrochæna truncata, *Sow.*

Proc. Zool. Soc. 1834, p. 21.

Animal excavating a smooth oval chamber at the end of a flattened narrow gallery, occasionally five times as long as the chamber itself.* The gallery is straight, variously bent, or even suddenly recurved at a considerable angle, according to circumstances. It is always lined with a shelly coat, not evidently different from the shelly matrix, but separable from it. The interior of the siphon gallery is more or less rugose, and towards the extremity is nearly bipartite. The presence of these creatures may always be detected by the 8-shaped holes they make; but there is no clue by which the probable place of their abode can be ascertained. When they make a sudden turn, in consequence of some knowledge of an approaching stranger even at a distance, they fill their discarded burrow with shelly lining. The English species has no objection to burrowing through the graves of departed brethren, carrying its tube across them: this was not noticed in any Mazatlan specimen. A ? foot mark is often observed opposite the anterior gape, but never so large as in Parapholas: occasionally in the adolescent shell, a chink is seen in a downward direction, filled with the black horny substance.

The valves have free room to open widely in the cavity. The form varies, even in the young shell, and often, both in outline and markings, approaches ovata. It may be known at once however by the great peculiarity of the hinge; in which the "small, spathulate lamina" which *Forbes & Hanl.* have recorded in their generic character, though scarcely observable in G. modiolina, assumes dimensions which almost entitle it and similar species to subgeneric rank. Umbos very near anterior gape: an indistinct diagonal line beyond which the concentric

* Mr. Darbishire found one which measured 4·5 in. exclusive of the cell.

striæ are coarser and more irregular. This (posterior) portion of the shell is covered with very copious epidermis, in wrinkled folds, as in Saxicava rugosa. Ligament long. The young shell has projecting umbos, and often serrated edges to the anterior gape. The largest specimen measures *long.* ·57, *lat.* 1·17, *alt.* 57. The smallest valve, *long.* ·02, *lat.* ·05.

Hab.—In Spondyli, Isle of Perico, Panama, *Cuming.*—Mazatlan; not uncommon in Spondylus Lamarckii, very rare in Chamæ, Patella Mexicana, and in Imperator olivaceus and unguis; *L'pool & Havre Coll.**

Tablet 43 contains 6 valves very young, and 3 pairs adolescent. 44, Young specimen, piercing the apex of Imperator unguis. 45, do. Imp. olivaceus, with Bryozoa, &c. attached.—46. Young specimen in situ in Imp. olivaceus, with another younger, coterminal.—47. Young specimen in Imp. olivaceus, with tube somewhat projecting, which is unusual at Mazatlan.—48. I. olivaceus broken across, and shewing 5 specimens of G. truncata, and one Lithodomus caudigerus, invading the Imperator's liver chamber.—49. Adolescent specimen in situ in fragment of Spondylus, with the tube laid bare, and the pedal chink and deposit. Also portions of several other tubes of Gastrochæna, Lithodomus and Petricola.—50, 3 adult specimens varying in outline, of which one displays a pearl formed near the hinge, another a lamina cutting off a large part of the anterior end, as often happens in large aged fossil Saxicavæ.—51. Fragment of Spondylus, displaying hole of G. truncata, which, having approached a Lithodomus too closely, has turned round, filling the vacant space with shelly matter.—52. Siphon pipe laid bare, by the decay of the worm-eaten Spondylus around: also burrows of Lithodomus plumula and Parapholas calva.—53, Pipes and thick lining of 3 Gastrochænæ in Patella Mexicana: the two siphons in one are all-but separated at the extremity.—54, 2 pipe-ends from Spondylus.—55, Fragments of shelly lining.

22. GASTROCHÆNA OVATA, *Sow.*

Proc. Zool. Soc. 1834, p. 21.

Burrow not differing perceptibly from that of G. truncata. Shell, when fresh, of a delicate lilac tinge, with sharp elegantly bent concentric ridges following the margin, closer at the an-

* In the Bristol Institution is a Tablet marked G. cuneiformis, from the West Indies, *Mr. Priske*, containing 2 specimens; of which one I was unable to separate from G. ovata, the other (in its burrow) from G. truncata. Mr. Hanley states, from the examination of a collection made by M. Bean in Guadaloupe, and sent to him by M. Petit, that several species of borers are common to the two oceans.

terior part. Epidermis not conspicuous. Lunular portion deeply impressed: umbos distant from margin. Hinge without spathulate lamina: mantle marks rugose. More or less elongated, approaching sometimes the more ovate forms of truncata, especially in the young shells, but distinguished at once by the hinge. The anterior margin in the young shells is generally serrated, like Pholas, more strongly than in truncata. Anterior portion either more or less than one-fifth of the entire length. The largest specimen measures *long.* ·76, *lat.* 1·1, *alt.* 6·2. Smallest, *long.* ·04, *lat.* ·08.

Hab.—Isle of Perico (Bay of Panama) and Isle of Plata, *Cuming.*—Mazatlan; in Spondylus Lamarckii, very rare; *L'pool & Havre Coll.*

Tablet 56, 1 valve and 2 pairs very young.—57, young specimen in situ.—58, 2 adult specimens; one lilac, fresh; the other white, large, dead.—59, fragments of shelly lining.

Family SAXICAVIDÆ.

Genus SAXICAVA, *Bellevue.*

23. Saxicava arctica, *Lin.*

(For the synonyms, both as to genus and species, of this Protean shell, see *B. M. Cat. Brit. An.* Part VII. pp. 86—89.)

? = Saxicava solida, *Sow. Proc. Zool. Soc.* 1834, p. 88: *D'Orb. Voy.* v. 521.

? = Saxicava Cordieri, *Gould. ms.*—Mazatlan, *Lieut. Green.*

This shell is named on the authority of R. M'Andrew, Esq. whose practical acquaintance with the forms it assumes both in Arctic and subtropical regions renders his opinion of weight. According to Hanley, Menke and Gould, it is a distinct species. I cannot separate some forms of it from solida. The creature seems to take delight in distorting itself, not thinking it necessary to lodge in an uneven cavity for that purpose. It seldom (if ever) bores, being found in cavities of Lithodomus &c. The young shells are just as variable as the old ones, sometimes assuming the characters of S. rugosa or the form of Sphænia Binghami, but generally displaying the narrow, anteriorly truncate, bi-tuberculate character of S. arctica. It rarely takes the genuine Hiatella form. Ligament of variable length, generally rather short. Valves capable of opening widely, though rarely

in a position to do so. Hinge teeth, 1 in each valve, rarely seen in adult.

Largest specimen measures	*long.*	·63,	*lat.*	1·17,	*alt.*	·47.
A broad flat sp.	„	„	·4,	„	·68,	„	·24.
A long narrow one	„	„	·3,	„	·66,	„	·2.
Smallest	„	„	·02,	„	·04,	„	·015.

Hab.—According to Forbes, Atlantic Ocean, Boreal Seas. Africa, China, Australia.—Canaries, *Webb & Berthelot.* B. M. Cat. Can. Moll. p. 22, no. 195.—New Zealand, *Capt. Stokes.* B. M.—*S. solida*: Clefts of rocks, 18 fm. St. Elena, *Cuming*: Peru, Lima, Callao, *D'Orbigny*, B. M. Cat. p. 58, no. 510.—*S. distorta*, Say, Rhode Is. *Jay.*—*S. Pholadis*, Sea of Okotsk, *Middendorf.*—Mazatlan; in Spondylus Lamarckii, nestling in crevices and burrows, also in Chamæ and Patella Mexicana, very rare adult, not common jun.; *L'pool & Havre Coll.* Fossil, Crag, &c.; very large in the pleistocene beds at Uddevalla, Sweden, *R. D. D.*

Tablet 60, 6 young valves.—61, 1 valve and 6 pairs various ages and shapes.—62, 1 specimen bored into, and the valves cemented open by tube of borer: also 2 fragments to shew ligament.—63, A young specimen in hole of Lithodomus caudigerus in Imperator unguis.—64, A specimen in situ in a Vermetus, off back of Spondylus.

Family PETRICOLIDÆ.

Genus PETRICOLA, *Lam.*

24. Petricola robusta, *Sow.*

Proc. Zool. Soc. 1834, p. 47.—*Sow. Thes. Conch.* part xv. p. 775, no. 14; pl. clxvi. f. 16, 17.—*Müller, Syn. Moll.* p. 229, no. 9.—*Philippi in Zeit. für Malac.* 1848, p. 163, no. 33; quasi sp. nov.: edidit *Desh.* in *B. M. Cat. Veneridæ, &c.* p. 210, no. 10. ? = P. bulbosa, *Gould's plates, ms.*

The name of this shell, which was well described by Sow. in 1834, was appropriated by Philippi in his 3*rd* Century of new shells for a supposed new species; which turns out fortunately to be a small specimen of Sow.'s species, and thus confusion of synonymy is unexpectedly avoided. Deshayes has unfortu-

nately copied this description into his *Cat. Ven. B. M.*, instead of the original one. The young is generally (so Phil.) "subglobosa, alba," and occasionally shews the radiating ribs "postice distantibus"; the bifidity of the anterior tooth in the left valve is rarely seen in the adult. When extremely young, the shell is irregularly rugose, but not sfiagreened: the apex is then moderately prominent: the rugosities soon fall into regular ribs dividing between the posterior and ventral parts; the interspaces are finely rugose. Very soon the apex disappears, and a large space round becomes eroded. The shell which has previously been white, assumes various shades of orange, lilac and chocolate, developing at last into a lustrous brown, especially at the muscular impressions. Meanwhile the characteristic concave decussating striæ appear between the ribs; and on the posterior ribs (which are generally closer than the ventral but not so close as the anterior ones) are gathered up into knobs. The anterior ventral part is generally much swollen, often with a concave margin between that and the posterior end, which is not unfrequently much produced, flattened, and even bent upwards. The short, semi-internal ligament (somewhat resembling Ungulina) is turned up spirally round the umbos, as in Chamæ, &c.

The burrow is shaped as the shell, with a rising corresponding with its posterior ventral depression, and without any siphon gallery. The opening is oval, irregular, and always exposes to view the extremities of both valves. Mr. Darbishire has one fourth of a Spondylus valve, with no fewer than eleven Petricolæ projecting their extremities. The interior of the burrow is irregular and rough. One of the Chamæ, hereinafter enumerated, displays a Petricola, which, having bored through the Chama and come to the rock, preferred flattening its own valve to undertaking the unexpected labour. This creature, having no power to move round in its hole, is frequently bored into by its neighbours. A pedal scar is occasionally seen towards the anterior end, sometimes deep, with dried horny substance as in Parapholas.

The largest specimen measures	*long.*	·87;	*lat.*	1·22,	*alt.*	·73,
The most oval	,,	"	·63,	,,	·78,	,,	·52,
The smallest	,,	,,	·06,	,,	·08,	,,	·04.

Hab.—In rocks, 6—11 fm., Panama and Isle Muerte, *Cuming.*—Jun. in Avicula margaritifera, Panama, *E. B. Philippi.*—Mazatlan: in Spondylus Lamarkii, not uncommon: very rare in Chama. Very young shells are rarely met with;

perhaps from living near the outside, and therefore being easily washed out; *L'pool & Havre Coll.**

Tablet 65, 4 young valves.—66, 2 pairs, 2 valves, adolescent.—67, 2 pairs, adult.—68, 2 pairs bored into and distorted.—69, specimens of dried foot.—A burrow may be seen in ?36, and a specimen in situ among the Chamæ.

25. PETRICOLA VENTRICOSA, *Desh.*

Proc. Zool. Soc. 1853, Pubi.—*B. M. Cat. Ven.* p. 214, no. 22. = *(teste Sow.)* P. denticulata, *Sow. Proc. Zool. Soc.*, 1834, p. 46.—*Sow. Thes. Conch.* part xv. p. 773, pl. clxvi. f. 6, 7.—*B. M. Cat. D'Orb. Moll.* p. 64, no. 564.—*B. M. Cat. Ven.*, p. 213. no. 21.

This shell agrees with the description of P. ventricosa better than with that of P. denticulata, and must rank with that species if they prove distinct. If they are identical, as *Sow.* supposes, his name, though not so expressive, has priority. It takes both the elongated and abbreviated forms. *Long.* 26, *lat.* 36, *alt.* 23.

Hab.—(P. denticulata) Payta (Peru) in hard clay and stones at low water, *Cuming.*—Arica, *D'Orbigny.*—(Var. abbreviata) Isle Plata, *Cuming.*—Payta D'Orbigny.—(P. ventricosa) Gulf of California, Mus. Cuming.—Mazatlan: burrowing in Strombus galea, extremely rare, *Havre Col.*—Received with other shells from the West Indies, P. P. C.

Tablet 70 contains 2 opposite valves.

26. PETRICOLA ————, *sp. ind.*

Tablet 71 contains a rugose fragment, apparently not identical with any published species from the W. American coast.

Hab.—Mazatlan: in Spondylus Lamarckii: *L'pool Col.*

* I strongly suspect that this species is also found on the W. African coast. I have a valve, received from the Bristol Institution where it had been before they had a single shell from the West Coast of America that I know of, and before Cuming's discoveries there. At that time there was plenty of trade between Bristol and Africa; and I believe the species came out of Ostrea iridescens of which they had a large stock. *Vide* remarks on that sp. and Placunanomia. If P. typica, Sow. Thes. Conch. No. 13. does not differ from robusta more than is there stated, it is probably the same species, from St. Thomas, W. Indies.

Genus RUPELLARIA, *Bellevue.*

Rupellaria, *Fleuriau de Bellevue*, 1802, *Bullet. Soc. Philom. nr.* 62.—*Philippi, Handb. d. Conch. & Mal.* in loco.
Gastrana, *Schum.* 1817.
Venerupis, *Lam.* 1818.—*Desh. B. M. Cat. Ven.* p. 189.

27. Rupellaria lingua-felis, *n. s.*

V. t. subcylindricâ, albâ, tenuissime et dense granulosâ, subdiaphanâ; granulis irregulariter confertis, lineis radiantibus confluentibus; circa umbones lævigatâ, liris concentricis interruptâ; strias incrementi nonnunquam monstrante; lunulâ indistinctâ; umbonibus prominentibus; intus politâ, margine planâ; impressiones musculares vix monstrante, sinu pallii magno, circulari; dentibus 3—2, *quarum una bifida; nymphis et ligamento parvis; dentibus et nymphis supra lineam cardinalem intus prominentibus.*

Shell in shape like P. mirabilis, *Desh.*, which represents it on the Californian coast; but recognized at once by its surface which presents, under the microscope, most delicate granulations somewhat like Tellina lingua-felis, whence its name.

Smallest specimen measures *long.* ·025, *lat.* ·03, *alt.* ·02,
Largest „ „ „ ·11, „ ·16, „ ·09.

Hab.—Mazatlan; in Chamæ and Spondylus Lamarckii, nestling in burrows, rare; *L'pool & Havre Coll.*

Tablet 72 contains 5 specimens in various stages of growth.

28. Rupellaria exarata, *n. s.*

V. t. formâ "Linguæ-felis" simili, umbonibusque ut in specie illâ: sed radiatim tenue sulcatâ, albicante, rufo-fulvo maculatâ: fortiori, nec intus politâ: dentibus 3-3, *quarum una bifida, extantibus: epidermide tenui, fuscâ.*

Shell in size and shape like V. lingua-felis, but wanting the granulose texture, and covered (except at the umbos, which are concentrically striated) with very fine rather irregular radiating ribs, as in Petricola, interrupted occasionally by lines of growth. Colour whitish, stained with chocolate. Hinge teeth projecting upwards, not sideways as in the last. Pallial sinus large, well rounded. These shells have the general appearance of Naranio, *Gray.*

Smallest specimen, *long.* ·018, *lat.* ·03, *alt.* ·015,
Largest „ „ ·13, „ ·21, „ ·12.

Hab.—Mazatlan; a small colony were found nestled, and greatly incommoding each other, in empty Balani on Murex princeps: *Havre Col.*

Tablet 73 contains 1 specimen in situ, in Balanus; 3 others of different ages.

29. RUPELLARIA————, *sp. ind.*

Tablet 74 contains a fragment resembling R. foliacea, *Desh.* Mazatlan; with strong radiating ribs crossed by erect and beautifully undulated laminæ. The sculpture smoothes off at the hinge margin.

Hab.—Mazatlan; from the back of a Spondylus Lamarckii: *L'pool Col.*

FAMILY CORBULIDÆ.

GENUS CORBULA, *Brug.*

30. CORBULA BICARINATA, *Sow.*

Proc. Zool. Soc. 1833, p. 35.—*Müll. Syn. Test. Viv.* p. 229.—*Rve. Conch. Ic.* 1844, pl. 3. f. 23.—*Hanl.* in *Wood's Suppl. Ind. Test.* pl. 12, f. 31.—*Hanl. Descr. Cat.* p. 46.—*B. M. Cat. D'Orb. Moll.* p. 70, no. 619.

Shell extremely swollen, the valves nearly equal, sometimes one a little overlapping the other at the posterior ventral margin. Epidermis thin over the body, thick over the margins of the valves. Irregularly concentrically striated over the surface, very finely between the posterior keels: umbonal portion smooth. Within, ligament affixed to the smaller tooth: posterior muscular scar rounded, on a projecting support; a smaller one behind: anterior scar oblong. Pallial line simple. In the 3 specimens which alone I have had an opportunity of examining, which are quite fresh, I cannot detect any pallial sinus. Those who have plenty of Corbulæ would do well to examine their interiors, which are not generally noticed in the descriptions. They are either very rare at Mazatlan, or have escaped detection, scarcely a dozen specimens having been found of all the species. *Long.* 2·7, *lat.* ·36, *alt.* ·28.

Hab.—In sandy mud, 7—17 fm., Panama, Real Llejos, Caraccas, St. Elena, *Cuming.*—West Columbia, Hanley, Jay.—Ecuador;

S. Elena, *D'Orbigny*.—Panama, common, *C. B. Adams*.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 75 contains 1 specimen, laid open.

31. CORBULA BIRADIATA, *Sow.*

Proc. Zool. Soc. 1833, p. 35.—*Mull. Syn. Test. Viv.* p. 230.—*Rve. Conch. Ic.* pl. 1, f. 3.—*Hanl. Suppl. Wood's Ind. Test.* pl. 10. f. 51.—*Hanl. Descr. Cat.* p. 47.—*B. M. Cat. D'Orb. Moll.* p. 70. no. 620.

Shell with valves nearly equal, ventral margin flattened, posteriorly rather widely overlapping. Epidermis scarcely visible except at the margin, where it is, as usual, thick. Within, purplish white, ligament attached to larger tooth. Posterior muscular scar strongly marked, partly projecting, partly indented, subcircular, with the little one behind coalescent. Anterior scar pear-shaped. Pallial line irregular; sinus very small. *Long.* ·33, *lat.* ·52, *alt.* ·26.

Hab.—Mud and sand, 3-6 fms., Chiriqui: 7 fm., in Bay of Caracas: *Cuming*.—Ecuador; Chiriqui: *D'Orbigny*.—W. Columbia, Jay.—Panama, very rare, *C. B. Adams*.—Gulf of California, Mus. Cuming.—Mazatlan; extremely rare: *L'pool Col.*

Tablet 76 contains the only specimen found, in extremely fine condition, flattened.

32. CORBULA PUSTULOSA, *n. s.*

C. t. parvâ, albâ, obesâ, solidâ, postice productâ, truncatâ, antice rotundatâ, ab umbonibus postice subangulatâ; valvâ minore plus minusve inclausâ, maxime in margine ventrali ad posticum decurrente, arcuatâ: valvis concentrice liratis, liris irregularibus, subrotundatis: epidermide tenui, ad marginem crassâ: lineis exillimis radiantibus pustularum minimarum repletis: umbonibus lævigatis.

Shell small, white, subglobose, produced posteriorly, with the valves overlapping, bent at the posterior end of the ventral margin; with irregular, somewhat rounded concentric ridges, crossed by the finest radiating lines, which under the microscope are found to consist of rows of minute pustules, probably formed in the epidermis, which is extremely thin over the body of the shell, coarse round the margin, and at the posterior side, which is rather angulated.

Mr. Cuming's specimen measures *long.* ·16, *lat.* ·24, *alt.* ·14,
The Mazatlan specimen „ „ ·11, „ ·16, „ ·11.

Hab.—Panama and St. Blas, 33 fm. *R. B. Hinds*, Mus. Cuming.—Mazatlan: one small pair nestling in Spondylus, and 1 valve in Chamæ, *L'pool Col.*

There is no doubt that the Mazatlan shell is the same as Mr. Cuming's beautiful specimen, hitherto undescribed. Tablet 77 contains the perfect specimen; I reserve the valve.

33. CORBULA POVULATA, *Sow.*

Proc. Zool. Soc. 1833, p. 35, 36.—*Müll. Syn. Test. Viv.* p. 230.—*Rve. Conch. Ic.* pl. 1. f. 7.—*Hanl.* in *Suppl. Wood's Ind. Test.* pl. 10, f. 52.—*Hanl. Descr. Cat.* p. 47.—*B. M. Cat. D'Orb. Moll.* p. 70, no. 622.

Tablet 78 contains 1 flat dead valve of regular oval shape slightly produced anteriorly, and very finely striated concentrically, which may belong to this species.

Hab.—In sandy mud, 7—17 fm. Xipixapi, and Bays of Montijo and Caraccas, *Cuming.**—Ecuador: Xipixapi, *D'Orbigny.*—Taboga, very rare but large, *C. B. Adams.*—Mazatlan; one valve, *L'pool Col.*

34. CORBULA————, *sp. ind.*,

Tablet 79 contains a fragment of what must be when perfect a most beautiful and remarkable species. It is extremely thin, white, translucent, with a very sharp diagonal posterior keel, and another close to the margin. Umbos very near the anterior end. Shell smooth near the umbos; afterwards with waved concentric ridges; posterior part with deep pits at a sharp angle with the ridges. The whole shell with radiating rows of dots (probably epidermal) as in C. pustulosa. Inside a stout, somewhat conical tooth in each valve, with corresponding pit. Interior surface very finely rugose. Mr. Hanley found a much more perfect specimen, which was most unfortunately crushed in transmission by the post.

Hab.—Mazatlan; from Spondylus Lamarckii; *L'pool & Havre Coll.*

* Mr. Reeve further states "A few odd valves of this species were *found by Mr. Cuming on the sands at* Real Llojos and *Mazatlan.*" In reference however to this last locality, Mr. Cuming states that his extreme point north, along the West American coast, was Conchagua, Bay of St. Carlos (or Fonseca): about 13° N. L. In all cases therefore where he is cited as the original collector at places north of this, the authority must be regarded as "Museum Cuming."

Genus SPHÆNIA, *Turton.*

For Monograph of this genus, with amended generic characters, see *A. Adams* in *Proc. Zool. Soc.* 1850, p. 86. See also *Forbes & Hanl. Br. Mol.* vol. 1. p. 189—193:—*Clark Br. Mar. Test. Moll.* p. 150.

35. Sphænia fragilis, *n. s.*

S. animali in cryptis latibulante, ergo varie distorto; testâ parvâ, tenui, subnacreâ, vix rugose striatâ; epidermide fusco-virente copiose indutâ, rugarum increscentium concentricarum plenâ, postice in siphone longâ porrectâ: parte posticâ plus minusve subcarinatâ; valvâ sinistrâ dente ligamentum ferente, plus minusve seu prolongatâ seu extante; dextrâ alveo conveniente, nonnunquam denticulo subextante: impressionibus muscularibus subrotundatis, sinu pallii lato, rotundato, haud alto.

It is surprising how much of the very minute description of S. Binghami given in *Forbes & Hanl. Br. Moll.* i. 191-2, applies exactly to individuals of this species. Indeed, if young specimens of the two were mixed together, I should hardly know any sufficient ground of specific distinction, except in the texture which is more nacreous, and the pallial sinus which is broad, though shallow. The young shells can sometimes be told from those of Saxicava arctica only by the hinge, as in Binghami; and there is often seen the little denticle by the ligament pit noticed by Turton, not Hanley, and conspicuous in young shells of Sphænia Binghami in my possession, nestling in crevices of limestone dredged off Weymouth. Like other nestlers (unlike the true borers, which are moderately constant in form) it is extremely irregular. Many well characterized species might be made out of extreme forms; but unfortunately for the lovers of multiplication, individuals were sufficiently numerous to supply many connecting links. The normal state appears to be not very inæquilateral and tolerably well rounded: the shell is then shaped somewhat like Psammobia: but it is generally more or less produced, when the posterior portion becomes marked off by an angle, in very long specimens amounting to a keel, sometimes with a trace of a double one. When it lives in dead Balani &c., it becomes very short, inflated and gibbous, resembling Corbula or sometimes Neæra. The ligamental plate then becomes narrow, projecting and sinuated, more like the tooth of Mya. These variations are seen in the

young as much as in the adult shells. A very small specimen was found to contain a minute young one. Specimens as broad as ·2 in. are very uncommon. One specimen was found having its siphon pipe projecting nearly half the breadth beyond the shell.

Smallest specimen measures			*long.*	·02,	*lat.*	·03	*alt.*	·015.
Elongated	„	„	„	·03,	„	·1,	„	·02.
Oval	„	„	„	·2,	„	·26,	„	·14.
Largest	„	„	„	·18,	„	·31,	„	·14.

Hab.—Mazatlan; inhabiting the burrows of worms and Mollusks in Chamæ and Spondylus Lamarckii; also in dead Balani on Strombus galea; not uncommon; *L'pool & Havre Coll.*

Tablet 80 contains 22 valves and 1 pair, jun. of various shapes.—81, a pair of regular shape with young nullipore growing on; pair with long siphon pipe; valve with internal lamina; 5 broken valves shewing hinge structure, &c.—82, the largest specimen, from hole of Lithodomus caudigerus in Strombus galea; a Balanus with oval Sphænia taken from within.

We insert here a notice of a unique shell described by A. Adams in the An. Nat. Hist. 1854, p. 418, under the name of Tyleria fragilis. Though named in honour of Mr. Tyler, he had it in his possession a considerable time without knowing of any thing remarkable attending it. I have taken several journeys to Liverpool and made enquiries in London, in hopes of seeing it, without success: but, as evidence that it is not mythical, I deposit, on Tablet 83, drawings made by Mr. Sowerby and most kindly placed at my disposal by H. Adams, Esq. It is possible that it is a deformed shell. I have occasionally noticed valves of Sph. fragilis with a tendency towards the same crenation at the posterior end, apparently through irritation of sand, &c.; also with the pallial line broken up. Mr. Tyler states that he found it in a burrow in the large Spondylus from Mazatlan; *L'pool Col.*

Family PANDORIDÆ.

Genus LYONSIA, *Turton.*

Syn. Mytilimeria, *Conr.* Magdala, *Leach.*

36. Lyonsia picta, *Sow.*

Proc. Zool. Soc. 1834, p. 88.—*? B. M. Cat. D'Orb. Moll.* p. 58, no. 506.

? = L. cuneata, *D'Orb.*—*B. M. Cat.* loc. cit.

? = Anatina cuneata, *Gray, Spic. Zool.* vi. 1828.

One perfect specimen of this remarkable shell was found by Master F. Archer, "burrowing" [? nestling] in Spondylus, and now graces his father's collection. It gapes almost as much as Gastrochæna, and displays a large ossicle within. The lunular portion is deeply excavated, and the posterior very greatly produced. Epidermis rugose, occasionally displaying fine radiating ridges. The growth is irregular, as usual in nestlers. The amount of gape varies considerably in Mr. Cuming's specimens. Size of Mr. Archer's specimen: *long.* ·8, *lat.* 1·2, *alt.* ·64.

The few fragments I found are known at once by the peculiar microscopic structure, described by Dr. W. B. Carpenter in *Rep. Br. Assoc.* 1847, p. 105.

Hab.—Attached to particles of sand in 11 fm., Isl. Muerte, *Cuming.*—Vancouver's Island, Col. Cuming.—Mazatlan: nestling in Chamæ, &c., extremely rare: *L'pool Col.*—? Arica, (Peru,) *D'Orbigny.*—The South Temperate analogue appears to be L. Patagonica, "Northern Patagonia, San Blas," *D'Orb.*—The W. Indian analogue is L. plicata, Gray.

Tablet 84 contains a perfect young specimen, just beginning its gape, and displaying the radiating striæ; also a fragment of an older one, shewing the hinge.—85, drawings of Mr. Archer's specimen, made by Master John Jackson.

Another species of Lyonsia, allied to A. cuneata, *Gray*, has been brought from Mazatlan: but as all the fragments even, in the L'pool Col., clearly belonged to L. picta, I have not ventured to include it. Like L. picta, it varies extremely in shape and gape: the latter being generally small, sometimes wanting. Texture smooth, extremely thin, white, glossy.

Family SOLECURTIDÆ.

Genus SOLECURTUS, *Blainv.*

37. Solecurtus affinis, *C. B. Ad.*

C. B. Ad. Pan. Shells, p. 300; no. 510.

The author of this species does not point out wherein it differs from its Atlantic analogue, S. Caribæus. The similarities are evident.

The smallest specimen measures *long.* ·3, *lat.* ·84, *alt.* ·14,
The largest „ „ „ ·77, „ 2·4, „ ·48.

Hab.—Panama, very rare, *C. B. Ad.*—Mazatlan: not common: *L'pool Col.*

Tablet 86 contains 4 young specimens.—87, 3 adult.—88, 3, lighter colour.—89, 3 with thinner epidermis.*

38. Solecurtus politus, *n. s.*

S. t. formâ "S. affini" simili; sed subtranslucidâ, violaceâ, extus lineâ fuscâ et lineis albicantibus nonnullis radiatâ; epidermide politissimâ, fusco-rubente: intus nymphis elongatis, denticulis 1-2 *acutis, sinu pallii versus umbones maxime arcuato; callositate ab umbonibus, lineâ fuscâ exteriore conveniente, subexpressâ decurrente.*

Known at once by the brownish violet colour, glossy epidermis, and dark ray corresponding with a slightly prominent ridge within. In this respect alone it resembles Machæra. In the pallial sinus, S. affinis is intermediate between politus and violascens: in colour, S. violascens is intermediate: in the prolongation of the nymphæ, S. politus. This species displays 2 small distinct muscular impressions between the umbo and the anterior adductor; which is oblong, but well defined: in S. violascens, it tapers off irregularly, uniting with these two: in S. affinis it is irregular, not tapering, uniting with the others which are also irregular. The largest specimen measures *long.* ·48, *lat.* 1·45, *alt.* ·23.

Hab.—Mazatlan: 4 specimens found with affinis: *L'pool Col.*

Tablet 90 contains the most characteristic specimen.

* Lower down the coast was found a large specimen which appears a distinct species, and I therefore append a description, and deposit the shell in the B. M. Col.

Solecurtus violascens. S. t. "S. affini" simili, sed majore, solida, violascente, rugis epidermidis tenuioribus; nymphis elongatis, sinu pallii versus umbones minus arcuato. Long ·95, lat. 3·33, alt. ·56.—*Hab.* S. W. Mexico, *P. P. C.*

39. ?Solecurtus ————, *sp. ind.*

Tablet 91 contains a fragment very flat, white, thin, with irregular very fine striæ, shewing within as well as without.

Hab.—Mazatlan: in Spondylus washings; *L'pool Col.*

Family TELLINIDÆ.

Genus SEMELE, *Schum.*

Syn. Amphidesma, *Lam.*

40. Semele proxima, *C. B. Ad.*

Amphidesma proximum, *C. B. Ad. Pan. Shells*, p. 289, no. 487.

Amphidesma proxima, (*sc.*-um) *Rve. Conch. Ic.* Amph. pl. 3, f. 20.

So much does this species vary in outline, and so closely do some forms approximate to S. elliptica, that it is still an open question whether C. B. Adams did right in separating it. The colour is typically orange within, and the pallial portion is punctured.

Hab.—Panama, rare, *C. B. Adams.*—Mazatlan; common; *L'pool Col.*

Smallest specimen measures	*long.* ·04,	*lat.* ·05,	*alt.* ·02,
Largest ,, ,,	,, 2·36,	,, 2·5,	,, 1·23,
Transverse ,, ,,	,, 2·03,	,, 2·36,	,, 1·17.

Tablet 92 contains a pair and a valve, extremely young, which probably belong to this species, though there are lateral teeth slightly developed.—93, 5 specimens, normal state.—94, 5 specimens more oblong.—95, 3 specimens very regularly rounded.—96, 3 specimens, very transverse.—97, 4 young specimens, with very light epidermis.—98, 2 specimens shewing interior.—99, 2 pairs and a valve, deformed in growth.

41. Semele ?venusta, *A. Adams.*

Proc. Zool. Soc. 1853, p. 96.

Amphidesma venusta [*sc.*-um] *Rve., Conch. Ic.* Amph. sp. 3. pl. 1, f. 3.

Tablet 100 contains a young valve which agrees in the main with this species. The concentric ridges are not developed,

and here and there a few radiating striæ appear under the microscope. *Long.* ·28, *lat.* ·34, *alt.* ·13.

Hab.—W. Columbia, Mus. Cum.—Mazatlan, 2 valves; *L'pool Col.*

Genus CUMINGIA, *Sow.*

For amended generic character, *v. Proc. Zool. Soc.* 1850, p. 24. The shell differs essentially from Semele, in its lateral teeth and ligamental spoon. The animal also differs, as from Syndosmya, in its irregular cryptophilic habits. The species here enumerated are given under protest. Cumingiæ are nestlers, like Sphænia and Saxicava, and therefore subject to every possible variation of form. They are fond of growing in company, and squeeze each other up into the queerest shapes. And yet the published specific characters are mainly drawn from the shape alone, with the very variable markings. Almost all the species are variously ribbed concentrically, with minute radiating decussations. The characters of the hinge may be more constant; but alas! neither Sow. nor A. Ad. even allude to them. I have examined about 60 specimens from Mazatlan which might easily be distributed into 20 species, with as good characters as those which distinguish Sow.'s species. C. B. Adams distributed his 14 specimens into 6 species, but mercifully forbore to describe the 4 supposed new ones, on the ground that they are "probably somewhat variable." Locality also is no great help: the Atlantic and Pacific, the N. and S. Temperate species not differing from each other so much as each species may within itself. Mr. Cuming has most kindly come to my rescue, and named the principal specimens according to his types: the smaller ones, in which there is least distortion, I have mapped out as well as the microscope would allow me. To do the work satisfactorily would require a very large number of individuals from various localities. The Mazatlan stock was large enough to confuse, not to help.

42. Cumingia lamellosa, *Sow.*

Proc. Zool. Soc. 1833, p. 34.

Lavignon lamellosa, *B. M. Cat. D'Orb. Moll,* p. 59, no. 518.

Lamellæ extremely irregular, sometimes scarcely shewing till the creature is nearly adult. Radiating striæ not strongly marked. Pallial sinus moderate: hinge teeth moderate, posterior lateral tooth the longest.

Smallest specimen measures *long.* ·04, *lat.* ·06, *alt.* ·02.
Largest „ „ „ ·49, ·72, ·24.

Tablet 101 contains 3 young valves.—102, the largest (imperfect) specimen.—103, a C. lamellosa, which had established itself within the empty remains of a Petr. robusta, which had itself gone to dwell inside the skeleton of a deceased relative which had originally constructed the burrow.*

The form *coarctata* was found by Mr. Hanley in Spondylus Lamarckii; *Havre Col.*

43. CUMINGIA TRIGONULARIS, *Sow.*

Proc. Zool. Soc. 1833, p. 35.—*Rve. Conch. Syst.* pl. 49, f. 2.—*C. B. Ad. Pan. Shells*, p. 288, no. 480.

Lavignon trigonularis, *Gray. B. M. Cat. D'Orb. Moll.* p. 59, no. 519.

Tolerably well distinguished by the great projection of the ligamental-spoon and hinge teeth. The laterals are very short, truncated, and of nearly equal length. Pallial sinus very large. Decussating striæ well developed. N. B. The muscular scars often vary in shape with the distortions of the shell. The largest specimen found measures *long.* ·5, *lat.* ·62, *alt.* ·32.

Hab.—St. Elena: among stones in deep water, *Cuming.*—Ecuador; St. Elena, *D'Orbigny.*—Panama, very rare, *C. B. Adams.*—Mazatlan: nestling in burrows in Spondylus Lamarckii; very rare; *L'pool & Havre Coll.*

Tablet 104 contains 1 perfect and 3 broken specimens, of various ages.

44. CUMINGIA CALIFORNICA, *Conr.*

Journ. Ac. Nat. Sc. Phil. 18 , p.

Teeth and pallial sinus intermediate between C. lamellosa and C. trigonularis. Anterior side generally swollen. The largest specimen found measures *long.* ·33, *lat.* ·52, *alt.* ·22.

Hab.—Upper California, *Nuttall.*—Mazatlan; nestling in burrows in Spondylus Lamarckii, very rare; *L'pool Col.*

Tablet 105 contains 1 young, and 2 adult specimens.

* So I have, in limestone from Weymouth Bay, Sphænia Binghami nestling in the tube of a Gastrochæna modiolina which had been formed by soldering together portions of a Thracia distorta through which it had burrowed.

45. CUMINGIA——————, *sp. ind.*

Messrs. Cuming and Hanley who possess perfect specimens of this shell, regard it as a new species. Let those describe it however who understand the specific marks in this genus. The few valves found were all toothless. The pit and tooth marks are extremely small; shell small, delicate, flat, triangular. It closely resembles C. striata, A. Ad. *Proc. Zool. Soc.* 1850, p. 25, and has affinities with Syndosmya tenuis. *Long.* ·3, *lat.* ·38, *alt.* ·15.

Hab.—California, Mus. Cuming.—In Chamæ, extremely rare; Mazatlan; *L'pool & Havre Coll.*

Tablet 106 contains 2 valves.

Tablet 107 contains 1 of three small specimens which I cannot identify with existing species. The form is very regular, like C. Cleryi, *A. Ad.* but the shell is convex, and marked as in the typical species. The teeth bear most resemblance to C. Californica, *Conr.* *Long.* ·18, *lat.* ·23, *alt.* ·11.

Hab.—Mazatlan: in Spondylus Lamarckii, nestling in burrows: extremely rare; *L'pool Col.*

GENUS SANGUINOLARIA, *Lam.*

46. SANGUINOLARIA PURPUREA, *Desh.*

Proc. Zool. Soc. 1854, p. 346, no. 137.

Compare Sanguinolaria tellinoides, *A. Adams* in *Proc. Zool. Soc*, 1849, p. 170: pl. 6, f. 6.

?=Tellina (non Strigilla) miniata, *Gould's Plates, ms.*

This shell is extremely like S. tellinoides, but differs in texture, "one being thin and delicate, the other coarse and strong in comparison," *Cuming.* Gould's description may prove his shell to be different. It seems almost as much a Tellina as T. rufescens. It is the Pacific analogue of S. rosea. Only 2 specimens were found in the L'pool Col. (Mus. Archer & B. M.); but as several specimens were in the London shops, it is probable that more were sent in the Havre Col. *Long.* 1·07, *lat.* 1·73, *alt.* ·47.

Hab.—Mazatlan: extremely rare; *L'pool Col.*

Tablet 108 contains 1 specimen.

Genus TELLINA, *Lin.*

47. Tellina rufescens, *Chemn.*

Chemn. vi. p. 105. t. 11. f. 97,—*Schroeter, Einl.* t. 3, p. 5. no. 11.—*Dilw. Desc. Cat.* vol. i. p. 85.—*Knorr*, vol. vi. t. 12, f. 1.—*Hanl.* in *Sow. Thes. Conch.* vol. i. p. 307, pl. 63, f. 213.

=T. operculata, *Gmel.* p. 3235, no. 32, *Var. exc.*—*Lam. ed. Desh.* 1836, vol. 6, p. 192.—*Wood's Ind. Test.* p. 19, no. 37.—*Hanl. Descr. Cat.* p, 62, t. 4, f. 37.

=T. cruenta, *Solander, ms.*—*Portland Cat.* p. 58, lot 1360.

=T. opercularis *Sow. Gen.* no. 31, f. 1.—*Desh. Enc. Meth.* vers t. 3, p. 1010, no. 9.

This shell must not be confounded with T. rufescens of Gmel. which = Venus decussata, var; nor with the too-similarly named T. rubescens of *Hanl.*, a shell found as far north as S. W. Mexico, *(P. P. C.)* but not yet obtained from Mazatlan. T. rufescens is known at once by its large size, red colour (often banded with whitish,) and greatly produced beak. Lower valve projecting, as in Corbula, and displaying faint radiating lines, which are generally obsolete on the upper. It gapes at both ends, and nearly approaches Sanguinolaria. *Long.* 1·73, *lat.* 3·17, *alt.* ·77.

Hab.—Coasts of Brazil, Humphreys.—Caribbæan Sea, Lam. "Cab. de M. Dufrene."—(Indian Ocean, Wood.)—Tumbez, (Peru,) in soft, sandy mud, 5 fm., *Cuming.* Mazatlan; rare; *L'pool & Havre Coll.*

The authorities for the Atlantic Ocean do not appear satisfactory. On the other hand, the shell being known to the old writers is in favour of its having been brought from the West Indian seas.

Tablet 109 contains 1 small specimen from the L'pool Col., and 1 large one from the Havre Col. in which it was less uncommon.

48. Tellina Broderipii, *Desh. ms.* (teste *Cum.*)

Compare Tellinides purpureus, *Brod. & Sow. Zool. Journ.* vol. iv. p. 363.—*Zool. Beech. Voy.* p. 153, pl. 42. f. 2.—=Tellina purpurascens, *Hanl. Descr. Cat.* p. 74, *suppl.* pl. 9, f. 18: do. in *Sow. Thes. Conch.* p. 295, no. 141, pl. 62, f. 194.

Shell closely resembling T. purpurea; from Real Llejos, *Cuming*. It differs from the plate in Beech. Voy. in having the umbos less pointed and the teeth smaller. The surface is crowded with extremely close concentric striæ, decussated (except on the fold area) by very fine radiating lines, which become obsolete, in one valve only, on the ventral portion. The fold area is nearly smooth (except lines of growth) on one valve; on the other, with rather sharp raised ridges, carrying on generally every other one of the concentric striæ. Epidermis light brown, very thin, coarser on the fold area. The species much resembles (though smaller) T. princeps, a valve of which was sent from S. W. Mexico, *(P. P C.)* It gapes on each side, and might almost pass for a Sanguinolaria, but for its flatness. *Long.* 1·18, *lat.* 2·12, *alt.* ·31.

Hab.—Mazatlan, 3 specimens (Mus. Archer, Darbishire, B. M.) *L'pool Col.*

Tablet 110 contains one specimen.

49. TELLINA.?? MAZATLANICA, *Desh.*

T. Mazatlandica, *Proc. Zool. Soc.* 1854, p. 359.

Tablet 111 contains a minute fragment which may be the young of this species, though the characters of the hinge are somewhat different. The Cumingian type measures: *long.* ·79, *lat.* 1·3, *alt.* ·32.

Hab.—Mazatlan: Col. Cuming.—?? Do. in Spondylus washings. *L'pool Col.*

50. TELLINA DOMBEI, *Hanl.*

Proc. Zool. Soc. 1844, p. 144.—*Hanl.* in *Sow. Thes. Conch.* p. 323.—*C. B. Ad. Pan. Shells*, p. 282, no. 464.

A plain, white, oblong shell, much swollen and produced anteriorly. *Long.* 1·1, *lat.* 1·45, *alt.* ·5.

Hab.—Panama, in sandy mud, 12 fm. *Cuming.*—Panama, rare, C. B. Ad.—Mazatlan, 2 specimens, *L'pool Col.*

Tablet 112 contains one specimen.

51. TELLINA FELIX, *Hanl.*

Proc. Zool. Soc. 1844, p. 71.—*Hanl.* in *Sow. Thes. Conch.* vol. i. p 281 : pl. 58, f. 52.—*C. B. Ad. Pan. Shells*, p. 282.

Closely resembling a West Indian species in form and colour: Hanl. compares it with T. donacina. *Long.* ·43, *lat.* ·7, *alt.* ·2.

Hab.—Sandy mud, 6—10 fm. Panama, *Cuming.*—Panamá, rare, *C. B. Adams.*—Mazatlan : extremely rare, *L'pool Col.*

Tablet 113 contains 1 perfect valve.

52. TELLINA STRAMINEA, *Desh.*

Proc. Zool. Soc. 1854, p. 363.

One specimen was found, about two-thirds the size of the Cumingian type which measures *long.* ·33, *lat.* .48, *alt.* ·17. It is known from neighbouring species by the rounded very faint concentric striæ, which are clearly displayed by the microscope near the umbo of the adult shell.

Hab.—Gulf of California, Col. Cuming.—Mazatlan, from Spondylus washing : *L'pool Col.*

Tablet 114 contain the specimen.—115 contains a minute valve and fragment which probably belong to the same.

53. TELLINA DONACILLA, *n. s.*

T. t. jun. donaciformi, valde transversâ, tenui, compressâ, albâ, concentrice liratâ ; liris acutis, subæquidistantibus, alternis, medio sæpe evanescentibus, antice rarioribus ; epidermide tenuissimâ, huc et illuc liras radiatim decussante ; postice valde productâ, subrotundatâ ; antice angulatâ, truncatâ, brevissimâ : marginibus ventrali dorsalique fere parallelis ; cardine dentibus duobus quarum unus bifidus cardinalibus, laterali uno postico brevi appropinquante, extante.

Related apparently to T. donaciformis, *Desh.* from Torres Straits ; from which it is known at once by the strong projecting lateral tooth. The shape is so remarkably like a Donax, that I have only varied the termination from the British T. donacina. The specimen is young, but well characterized except in the inner surface, which does not display the muscular impressions. *Long.* ·08, *lat.* ·14, *alt.* ·05.

Hab.—Mazatlan : off Spondylus Lamarckii, *L'pool Col.*

Tablet 116 contains the only valve found.

54. TELLINA PUNICEA, *Born.*

Test. Mus. Cæs. Vind. p. 33, pl. 2, f. 2.—*Dorset Cat.* p. 30, pl. 7, f. 5.—*Linn. Trans.* vol. 8, p. 50.—*Brit. Mar. Conch.* p. 66.—*Brown Illustr. Conch. Gr. Br.* p. 100.—*Gmel. Syst. Nat.* p. 3239.—*Wood, Ind. Conch.* p. 20, no. 47.—*Dillw. Descr. Cat.* p. 90.—*Lam. ed. Desh.* vol. 6, p. 196.—*Schroeter Einl. t.* 3. p. 22, no. 79.—*Desh. Enc. Meth.* vers. t. 3, p. 1011. no. 12.—*Hanl.* in *Sow. Thes. Conch.* vol. 1. p. 239, pl. 58, f. 89, and pl. 60, f. 154.—*B. M. Cat. Moll. D'Orb.* p. 61, no. 433.—*Forbes & Hanl. Br. Moll.* vol. 1, p. 314.

=Donax Martinicensis, *Lam.* teste *Gray.*
=Tellina alternata, *Sow.* teste *Gray.*
= ,, angulosa, *Gmel.* teste *Desh.*
= ,, simulans, *C. B. Ad. Pan. Shells*, p. 284.
?=striata, *Chemn. Conch.* t. 10, tab. 170, f. 1654-5; teste *Dillwyn & Desh.*: non *Forbes & Hanley, Br. Moll.*, nec *Hanl.* in *Thes.*

The late respected and very accurate Prof. Adams made his T. simulans out of a valve he found of this species on what was (to him) the wrong coast. Unfortunately for his theory, the very slight differences he relied on (deeper furrows continued over the flexure, interspaces less flattened, and lateral teeth nearly obsolete) are not constant in the Pacific waters; and if one shell is common to the two oceans, which he is obliged to allow in the case of Crepidula unguiformis, why may not this be? The shell is known at once by its regular Tellinides shape, solid texture, pink colour variously banded with white, and deeply channelled furrows, some of which generally coalesce on one side before they reach the flexure. The angle of the ligamental area is more or less developed: the passage of the sulcations over the fold varies not only in different specimens, but in the same shell, in the opposite valves, or from young to old. The closeness and flattening of the ribs, the colour and the size of the lateral teeth also vary considerably, though I have only had an opportunity of examining about 40 specimens. *Long.* 1·15, *lat.* 1·9, *alt.* ·47.

Hab.—[Coasts of Britain, Pultency, Wood, &c]—"A West Indian Shell, introduced into our Fauna through having been figured in the Dorset Catalogue as identical with striata Chemn." *Forbes & Hanley.*—Mediterranean, Lam. ed Desh.—Cuba, *Sagra* in B. M. Cat. p. 36.—Brazils, *D'Orb*, in B. M. Cat. p. 61.—St. Domingo, Sir. R. Schomberg, in B. M.—Trinidad, Hanl.—This, like many other West Indian shells,

has found its way into British and Mediterranaen lists without sufficient authority.

T. striata, Chemn. (=angulosa, Gmel.; =læta Pult. =Don. Martinicensis, Lam. =T. punicea, Turton, Dillw. &c.) *hab.* W. Indies Coasts of Guinea, and Rhode Island, U. S.; Chemn.

T. simulans, C. B. Ad. *hab.* Xipixapi in W. Columbia, sandy mud, 10 fm.; *Cuming.*—Panama (1 valve), *C. B. Ad.*—Mazatlan: very rare; *L'pool Col*; rare, *Havre Col.*—Guayaquil, *Hinds.*

Tablet 117 contains 2 pairs and 1 valve, shewing variations.

55. TELLINA ?CUMINGII, *Hanl.*

Proc. Zool. Soc. 1844, p. 59.—*Sow. Thes. Conch.* vol. i. p. 223, pl. 58, f. 72.—*C. B. Ad. Pan. Shells*, p. 281, no. 463.

Tablet 118 contains 2 fragments which seem to present the colours and markings of this species.

Hab.—Guacomayo, in coral sand, *Cuming.* Panama, extremely rare, *C. B. Adams.*—Mazatlan: fragments in shell washings, extremely rare; *L'pool Col.*

56. TELLINA ?EBURNEA, *Hanl.*

Proc. Zool. Soc. 1844, p. 61.—*Hanl.* in *Sow. Thes. Conch.* vol. i. p. 241, pl. 57, f. 91.

Tablet 119 contains a fragment with deep sulci and stout ribs, which may belong to this species.

Hab.—Tumbez, (Peru,) in soft sandy mud, 5 fm., *Cuming.*—?Mazatlan: in Spondylus washings, *L'pool Col.*

57. ?TELLINA REGULARIS, *n. s.*

? T. t. jun. suborbiculari, convexiusculâ; margine ventrali subrecto, umbonibus prominentibus; diaphanâ, albâ; tenuissime et confertim concentrice liratâ; liris acutis, interstitiis aut lævibus aut huc et illuc lineis radiantibus vix decussatis; flexurâ nullâ; ligamento minimo; cardine dentibus cardinalibus 3, *paululum divergentibus, lateralibus* 2 *distantibus, validis.*

An aberrant species, so regular in form that externally it would range better with Kellia. It wants the spoon-shaped

process of Cumingia, but the ligament is scarcely apparent. *Long.* ·06, *lat.* ·07, *alt.* ·04.

Hab.—Mazatlan: from Spondylus washings; *L'pool Col.*

Tablet 120 contains all that was found; viz. 1 perfect valve with a portion of the other.

58. TELLINA LAMELLATA, *n. s.*

T. t. "*Tellinæ liræ*" *simili, sed magis æquilaterali, et carinâ umbonum carente: lamellis acutissimis, irregulariter distantibus; umbonibus valde prominentibus.*

A beautiful little shell, very flat, thin, white, transparent; cardinal and lateral teeth moderately strong; spaces between the lamellæ smooth; outline oval, very regular except where the umbos project; flexure wanting. It might have been the young of T. lira, but for the entire absence of the stout umbonal ridge of that species. *Long.* ·1, *lat.* ·13, *alt.* ·03.

Hab.—Mazatlan; nestling on back of Chamæ and Spondylus Lamarckii, extremely rare; *L'pool Col.*

Tablet 121 contains 1 pair and 2 opposite valves.

59. TELLINA ?? PUELLA, *C. B. Ad.*

C. B. Ad. Pan Shells, p. 283, no. 468.

Tablet 122 contains an open pair and a valve which may belong to this species. I think however that the valve is distinct, and displays certain symptoms of Semele, of which I have not seen the very young shell, and am therefore ignorant of its variation in growth. An unfortunate cough made away with the opposite valve, which however had previously adhered by an external ligament. Whether there be an internal ligament as well, repeated microscopic examination has as yet failed to determine. *Long.* ·075, *lat.* ·095, *alt.* ·035.

60. TELLINA ?? DELICATULA, *Desh.*

Proc. Zool. Soc. 1854, p. 363.

Tablet 123 contains a fragment which may possibly be the young of this exquisitely beautiful species. Mr. Cuming's unique specimen displays, in addition to the features recorded in Desh.'s description, a pretty general penciling of a dark

colour in irregular radiating lines, crossing the oblique striæ. It measures *long.* ·37, *lat.* ·64, *alt.* ·12.

Hab—Mazatlan; Col. Cuming.—?? Mazatlan; in Spondylus washings; *L'pool Col.*

61. TELLINA BREVIROSTRIS, *Desh.*

Proc. Zool. Soc. 1854, p. 362.

This little valve seems to suit the description above quoted: it differs from T. gracillima in being very inæquilateral, the lateral and cardinal teeth very strong, and the lamellæ very regular, not much raised and rather close. *Long.* ·03, *lat.* ·05, *alt.* ·015.

Hab.—Central America and California [? Gulf], Col. Cuming.—Mazatlan; extremely rare, jun; *L'pool Col.*

Tablet 124 contains 1 valve, and a fragment of a larger specimen. Nothing else was found.

62. TELLINA ? DENTICULATA, *Desh.*

Proc. Zool. Soc. 1854, p. 365.

Shell like a little T. crassa, with exceedingly large and projecting lateral teeth; muscular impressions strongly marked. Pallial line indistinct. The outside of both valves is worn, and prevents the identification of the species. *Long.* ·065, *lat.* ·07; *alt.* ·02.

Hab.—Unknown, Col. Cuming.—? Mazatlan; from Spondylus washings; *L'pool Col.*

Tablet 125 contains the only specimen.

63. TELLINA ———, *sp. indet.*

Tablet 126 contains an imperfect valve remarkable for its 3 strong rather divergent cardinal teeth; the lateral ones are not developed, but there appear spaces for their reception from the opposite valve.

Hab.—Mazatlan; off Spondylus; *L'pool. Col.*

64. TELLINA ———, *sp. indet.*

Tablet 127 contains a broken valve remarkable for its subdiaphanous concentric lines on a smooth surface. A fragment

with the surface indented may be an older form of the same species. Shell suborbicular; lateral teeth distinct.

Hab.—Mazatlan; from Spondylus washings; *L'pool Col.*

65. TELLINA BURNETI, *Brod. & Sow.*

Zool. Journ. vol. iv, p. 362, t. 9, f. 2.—*Hanl. Descr. Cat.* p. 72, t. 13, f. 51.—*Hanl.* in *Sow. Thes Conch.* vol. i. p. 271.

= Lucina cristata, *Recluz*, teste *Jay.*

After examining more than 300 specimens of this most aberrant shell, I cannot quote any noteworthy variations. It seems as though the creature was quite satisfied with its beauty, without endeavouring to improve it. The valves however are occasionally a little more bent, and the striæ and knobs a little more or less close. To the shape of a Myadora, it adds the hinge of a Tellina. It has an Atlantic analogue, T. lunulata, found fossil in the Pleistocene beds of S. Carolina. In this however, the left and not the right valve is flat. A species of similar form is found fossil in the palæozoic rocks, agreeing more with the Atlantic shell. *(Woodw.)* T. Burneti owes its present wide distribution in collections to this importation from Mazatlan: even this spring a specimen was sold at a London sale for 15*s*. *Long.* 1·23, *lat.* 1·37, *alt.* ·23.

Hab.—Found in the Estuary of Mazatlan, among the shoals of large Pinnæ which are left dry at low water, *Lieut. Belcher.*—Salango, W. Columbia, Hanley.—St. Elena, *Cuming.*—Gulf of California, Mus. Cum.—W. Columbia, *Lieut. Freer* in Bristol Museum.—Mazatlan; not uncommon; *L'pool Col.*

Tablet 128 contains 3 specimens of different ages.

GENUS STRIGILLA, *Turt.*

Strigilla *Turton*, pars, Tellina, *auct.* A group of Tellinidæ conveniently separated for their Lucina-like shape and divaricated sculpture.

66. STRIGILLA (Tellina) CARNARIA, *Linn.*

Tellina carnaria, *Linn. Syst. Nat.* ed. 12, p. 1119.—*Donov. Br. Shells*, vol. ii. pl. 47.—*Linn. Trans.* vol. viii. p. 57.—*Dorset Cat.* p. 31, pl. 5, f. 6.—*Turt. Conch. Dict.* p. 177.—*Chemn. Conch. Cab.* vol. vi. p. 130, pl. 13, f. 126.—*Wood Ind. Test.*

p. 22, no. 79.—*Dillw. Descr. Cat.* vol. i. p. 100.—*Gmel.* p. 3240, no. 70.—*Schroet. Einl.* t. 2, p. 660.—*Mont. Test. Br.* p. 73.—*Born. Mus.* p. 37, t. 2, f. 14.—*Desh.* in *Lam. An. s. Vert.* vi. 209.—*Hanl. Rec. Sh.* vol. i. p. 72, pl. 4, f. 79.—*Hanl.* in *Sow. Thes. Conch.* vol. i. p. 260, pl. 56, f. 37, 38.—*Forbes & Hanl. Br. Mol.* vol. i. p. 313.—*Middendorf Mal. Ross.* Abth. iii. p. 60, no. 3.—*B. M. Cat. D'Orb. Moll.* p. 61, no. 536.—*B. M. Cat. Sagra Moll.* p. 36, no. 434.

Cardium carneosum, *Da Costa, Brit. Conch.* p. 181.—*List. Conch.* t. 339, f. 176.

Lucina carnaria, *Lam. An. s. vert.* t. vi. p. 227, no. 8.—*Flem. Br. An.* p. 442.—*Brit. Mar. Conch.* p. 75.—*Payr. Cat. de la Corse*, p. 41, no. 68.

Strigilla carnaria, *Turt. Dith. Br.* p. 118, pl. 7, f. 15.

? = Strigilla miniata, *Gould's plates.*

I have not been able to see Gould's description; but, as Mr. Nuttall informs me that this shell is plentiful at Sta. Barbara and as his specimens are even more like the W. Indian ones than the Mazatlan shells are, I presume that the S. miniata is a further development of the theory which produced T. simulans, *C. B. Ad.* It appears to be a very widely diffused species, being one of the very few found N. and S. of the Gulf of California, and spreading through the Atlantic ocean probably to the Mediterranean and Euxine. Valves have been thrown up on our own shores.—The Mazatlan specimens are generally much paler than the W. Indian, but some have as deep a tinge. The character of the markings is exactly alike, though they vary among themselves in the crowding of the striæ, &c. They are occasionally marked with a yellowish tinge, and are generally more or less stained with black, probably from the mud in which they lived. The shell appears to differ from T. sincera, *Hanl.*, found by C. B. Ad. at Panama, (rare.) Hanl. gives it as from N. W. Coast of America on the authority of Dr. Sinclair; but Nuttall's Californian specimens are undoubtedly T. carnaria. *Long.* ·9, *lat.* ·98, *alt.* ·42.

Hab.—[Scarborough, Devon and Cornwall, Da Costa, &c.]—American Ocean, Wood.—Jamaica and Barbadoes, Lister.—Curaçoa, Gronovius.—W. Indies, W. Columbia, *Hanl.*—Cuba, *Sagra.*—Brazils, *D'Orb.*—Mediterranean, Lam. Risso; non Philippi, nec Forbes; dubitat Middendorf.—Corsica, *Payrandeau.*—Naples, P. P. C.—Sudate; Black Sea, teste

Rathke, Siemaschké.—Santa Barbara, abundant, *Nuttall*.—Mazatlan: not common; *L'pool Col.*

Tablet 129 contains 6 pairs and 2 valves, shewing variations. The smaller valve may be T. cicercula, *Phil.*, in *Zeitschr. für Mal.* Feb. 1846, p. 19. I cannot however separate it from S. carnaria, of which it appears the young. The description of T. cicercula exactly applies to this, which is the left valve. Menke in quoting the species among Melchers' Mazatlan Shells, *Zeitschr. f. Mal.* 1847, p. 188, no. 53, says that it is only the left valve which possesses the sculpture in question: so does the left valve of T. carnaria, and that alone. Menke *loc. cit.* describes a new species, T. areolata, from the West Indies, intermediate between T. cicercula and T. carnaria, with a similar smooth space on the left valve.—Philippi also describes from Mazatlan *(loc. cit.)* T. lenticula, T. dichotoma, and T. ervilia. In his Abbil. Conch. for Aug. 1846, p. 24, he also gives the ancient T. pisiformis, Linn. (along with Diplodonta semiaspera) as common to Mazatlan and the Caribbean Sea. Mazatlan must be rich in Strigillæ, according to Philippi!

67. ?STRIGILLA LENTICULA, *Phil.*

Tellina lenticula, *Phil.* in *Zeitsch. f. Mal.* 1846, p. 19.

Tablet 130 contains a broken specimen which probably belongs to this species, which, says Philippi, while agreeing in form and size with T. pisiformis, has the sculpture of Lucina digitaria. It may however belong to Lucina eburnea, *Rve*, Conch. Icon. pl. 8, f. 49, found in sandy mud, 11 fm., St. Elena and Panama, *Cuming*.

Hab.—Mazatlan, Philippi.—?Do. fragments, off the back of Chama; *L'pool Col.*

68. ——— ———, *sp. ind.*

Tablet 131 contains a fragment of a thin shell of moderate size, perhaps a Psammobia, (possibly an unknown Donax,) strongly angulated, with very fine, slightly rugose striæ, coarser on the angular part. It is white, slightly bordered with orange.

Hab.—Mazatlan; confined in the mouth of Trivia sanguinea; *L'pool Col.*

Family DONACIDÆ.

Genus IPHIGENIA, *Schum.*

Syn. Capsa, *Lam.* 1818, (non 1801.) Donacina, *Fer.*

69. Iphigenia altior, *Sow.*

Capsa altior, *Proc. Zool. Soc.* 1832, p. 196, (teste *C. B. Ad.*)—*Müll. Syn. Test. Viv.* p. 225.—*Hanl. Descr. Cat.* p. 86.—*Hanl.* in *Suppl. to Wood's Ind. Test.* pl. 14, f. 34.—*C. B. Ad. Pan. Shells.*, p. 276, no. 453.

Shell very variable in outline, sometimes nearly equilateral, sometimes much produced anteriorly, sometimes incurved at the posterior ventral margin. The outside has the usual olivaceous epidermis. The inside is more or less stained with violet. Bifidity of cardinal teeth more or less developed: lateral teeth almost evanescent in one valve, absent in the other.

Smallest specimen measures	*long.* 1·,	*lat.* 1·37,	*alt.* ·56.
Longest „ „ „	1·88, „	2·54, „	1·11.
Aberrant „ „ „	1·72, „	2·12, „	1·03.

Hab.—Gulf of Nicoyia, in coarse gravel, 12 fm. *Cuming.*—*Var.* Tumbez, thin mud, 5 fm. *Cuming.*—St. Elena, Jay.—Panama, extremely rare, *C. B. Adams.*—Mazatlan: very common; *L'pool & Havre Coll.*—The Atlantic analogue is I. Braziliensis. A closely allied species is from the Gambia; *Chief Justice Rankin*, Bristol Mus.

Tablet 132 contains 5 specimens in the normal state.—133, 5 specimens more transverse.—134, 5 specimens indented.—135, 2 specimens of abnormal growth.—136, 1 specimen with very thin epidermis.

70. Iphigenia ? lævigata, ? *cujus.*

This shell is regarded by Dr. Gray as an abnormal variety of I. altior. It has much more the shape of I. Braziliensis. The most deeply indented I. altior is far removed from it. Mr. Cuming has similiar specimens from the same coast, which he regards as an undescribed species. I have seen it with the name Capsa lævigata, but do not know on what authority. It is characterized by very overlapping umbos; subcarinated, subtruncated posterior side; deep posterior ventral sinus;

anterior side much elongated. *Long.* 1·52, (ad sinum 1·37,) *lat.* 2·28, *alt.* ·9, (ad sinum ·78.)

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 137 contains the only specimen I found: Mr. Whitehead of Liverpool found another.

Genus DONAX, *Linn.**

71. Donax carinatus, *Hanl.*

Proc. Zool. Soc., 1843, p. 5.—*Rve. Conch. Icon.* pl. 2, sp. 11.—*Wood's Suppl.* pl. 14, f. 28.

Shell with a blunt keel, and posterior area covered with slightly expressed striæ which are scarcely rugose here and there. Epidermis very thin, deciduous except round the margin. Ventral margin almost always regularly excurved. The purple colour generally predominates in this, as the chesnut in D. culminatus. Form and markings very constant, except, as usual, in the proportion of length and breadth. *Long.* ·93, *lat.* 1·62, *alt.* ·63.

Hab.—San Blas, Gulf of California, Reeve.—Tumaco, *Hinds*, B. M.—Mazatlan; rare; *L'pool Col.*

Tablet 138 contains 2 specimens in the normal state, and one with two remarkable laminæ in the interior of one valve, near the posterior adductor.

72. Donax culminatus, *? n. s.*

D. carinatus, var: *Hanl. ms.* teste *Cuming.*

D. t. "D. carinato" simili, sed carinâ multo acutiore, productâ, margine ventrali sæpe prope carinam paulum incurvato; nitentiore; striis radiantibus obsoletis et crenulatione internâ conveniente crebrioribus; aream posticâ striis radiantibus creberrimis valdeextantibus, granosis, granis versus marginem rugosis; castaneo-purpureo.

I had passed this shell over as the young of D. carinatus, till I obtained a number of large valves with other West Coast shells, which at once displayed the remarkable characters of the posterior area, the sharp ridge, and the very granular crowded striæ. Having examined more than 60 specimens of D. carin-

* The specific termination being given as feminine in *P. Z. S.*, *B. M. Cat.* *D'Orb. Moll.*, *Rve. Conch. Icon.*, *Jay's Cat.* &c., it is desirable to remember that Donax is masculine both in Latin and Greek: (*v.* Lex.) In quoting, the terminations are altered accordingly.

atus, without seeing the slightest approach to these characters, I am obliged for the present to consider them specific. Size of the Mazatlan specimen; *long.* ·55, *lat.* ·95, *alt.* ·33. Ordinary size, as in D. carinatus.

Hab.—Mazatlan; 1 young specimen; *L'pool Col.**

Tablet 139 contains this specimen, and two valves, probably from the Central American coast.

73. DONAX TRANSVERSUS, *Sow.*

Tank. Cat. App. p. 4, no. 226.—*Rve. Conch. Icon.* pl. 6, sp. 36.

Known from D. scalpellum; *Gray*, (Gulf of California) by the peculiar incurving of the anterior dorsal line; and by the character of the posterior area, which has at the margin one large and two small flexures, while the surface is covered with radiating striæ, very finely and granularly serrated. *Long.* ·56, *lat.* 1·34, *alt.* ·3.

Hab.—Mazatlan; extremely rare; teste *R. Tyler, Esq.*, who found a fresh valve concealed in a Chama from the *L'pool Col.* The other valve is nowhere to be found.

Tablet 140 contains this valve, most kindly presented by Mr. Tyler.

74. DONAX ASSIMILIS, *Hanl.*

Proc. Zool. Soc. 1845, p. 17.—*C. B. Ad. Pan. Shells*, p. 277. no. 454.—*Rve. Conch. Icon.* pl. 2, sp. 10.

This species is used for food at Panama, where the natives scoop to its depth, and keeping to the same level find them in great abundance. (*C. B. Ad.*) *Long.* ·92, *lat.* 1·36, *alt.* ·51.

Hab.—Panama, Mus. Cuming.—Do. very plentiful, a few inches deep in sand at 3-4ths tide level, *C. B. Adams.*—Mazatlan, *Lieut. Green.*—Mazatlan; 1 valve only; *L'pool Col.*

Tablet 141 contains the solitary valve.

75. DONAX PUNCTATO-STRIATUS, *Hanl.*

Proc. Zool. Soc., 1843, p. 5.—*Rve. Conch. Icon.* pl. 3, f. 16.

Var. = D. radiatus *Val.* in *Humb. Rec.* vol. ii, 1833.

? = D. flexuosus, *Gould's plates.*

* An extremely similar shell is given in the Bristol Museum as Donax rugosus, *Dr. Cutting*, W. Indies.

Although there is little doubt that Valenciennes' species is the rayed variety of this shell, and therefore has priority, yet as his description is not accurate enough for certainty, and as it only applies to a very small part of the species, Hanley's expressive name is retained. The punctatostriate character however is by no means peculiar to this shell. Some forms are exceedingly hard to tell from D. Conradi, *Desh.*; including D. contusa, *Rve.*. The following are believed to be the main characters of the shell. Surface smooth, shining, with very thin deciduous epidermis, rarely seen. Not grooved, but with rows of extremely fine dots indented as with a bookbinder's tool. Rows often intercalated near the anterior end. Margin with strong squarish crenations inside: the same outside toward the posterior slope; about the middle, grooves appear dividing each, answering to the intercalary rows: at the end a broad surface is channeled off, in which each crenation gives off a fang something like a (ʿ) to join the external rays. This intricate and very characteristic structure will generally tell the species at once from the aberrant forms of D. Conradi. In the posterior slope, the punctate rows are very close; in the lunular portion entirely absent. The ordinary colour is pale yellow or white, sometimes a rich orange yellow; generally rayed with purple about the lunule with occasional stains elsewhere; often tinged with green about the posterior slope and umbos, occasionally rayed with brown (=D. radiata, *Val.*) with the rays often not corresponding on the two valves. Umbos white or pale yellow, sometimes rich transparent orange, sometimes with a penciling of purple, sometimes two purple spots. Shape normally trapezoid, with the umbos sub-central: but often with the posterior part shortened, and the anterior much elongated. The end is then tapering: but often it is short and very gibbous. Ventral margin almost always well developing the angular swelling. Inside generally rich purple. Lateral teeth short but very strong, the anterior truncated: in the opposite valve small.

Largest specimen measures			*long.*	1·15,	*lat:*	1·64,	*alt.*	·6.
Transverse	,,	,,	,,	·96,	,,	1·46,	,,	·57.
Stumpy	,,	,,	,,	·79,	,,	1·06,	,,	·48.
Smallest	,,	,,	,,	·18,	,,	·26,	,,	·11.

Hab.—South America, *Capt. Ld.ᵗ Byron* [?].—Mazatlan; in extreme profusion; *L'pool Col.*

Tablet 142 contains 15 specimens, normal shape, rich orange yellow.—143, 10 sp. same colour, transverse shape.—144, 9 sp.

same colour, lunular purple ray on one valve only.—145, 9 sp. same colour, purple rays absent.—146, 10 sp. and 2 valves, pale yellow: this is the most frequent state.—147, 8 sp. white, normal shape.—148, 8 sp. white, transverse.— 149, 12 sp. white and pale yellow, with irregular pale violet concentric bands.—150, 5 sp. orange yellow, similarly banded.—151, 5 sp. stained with purple and green.—152, 15 sp. yellow, green at umbos and posterior slope.—153, 15 sp. whitish, banded with violet, green at posterior slope.—154, 9 sp. plain yellow with greenish slope.—155, 9 sp. white with greenish slope.—156, 7 sp. orange yellow stained with purple.—157, 2 sp. and 1 valve, do, highly coloured; form approaching D. Conradi.—158, 6 sp. with broad brown rays.—159, 6 sp. with very faint rays.—160, 5 sp. shewing distorted growth.

Besides these were found a few scores of specimens which, when examining D. punctatostriatus I have generally turned over to D. Conradi; when examining the latter, have been disposed to turn back again. They are here grouped according to the preponderance of characters.—Tablet 161 contains D. punctatostriatus approaching D. Conradi, 4 sp. whitish.—162, 6 sp. yellow.—163, 3 sp. rayed.—164, 2 sp. yellow, transverse.—165, 3 sp. reddish, transverse.—166, 3 sp. whitish, narrow margin.—167, 3 sp. very gibbous.—In all 192 shells, the result of very frequent elimination from an examination of many thousand specimens; no two probably being exactly alike.

75 (*b.*) DONAX ? PUNCTATOSTRIATUS, *var.* CÆLATUS.

D. ? punctatostriatus, t. maxime inæquilaterali, margine ventrali vix angulato: superficie postica dense liratâ, liris expressis radiantibus: interstitiis dense decussatis, lineolis valde impressis: sculpturâ partem versus anteriorem, in lineas punctarum mutante, punctis angulatis: margine plerumque simplici, epidermide densâ rugosâ tecto.

Nearly 40 specimens have occurred, agreeing in the above characters, while only 2 shewed the least disposition to depart towards the ordinary type. Shape extremely inæquilateral, anterior end much prolonged. Sculpture deeply marked on the posterior and posterior ventral part; with elevated ridges, and the furrows not simple rows of dots as in D. punctato-striatus, but with short lines impressed as with a file-cutter's tool. These gradually subside anteriorly into punctate striation, but even then the dots are angulated, not round. There is a large

smooth lunular portion, not specially coloured. The margin is generally simple, nearly as in D. Conradi: and when it has the intercalary grooves proper to D. punctatostriatus, they are rarely carried up into intercalary rows of dots. The epidermis is remarkably thick round the margin. Colour sometimes white, occasionally yellow, but generally stained with rich reddish purple. Whether it be an aberrant variety of D. punctatostriatus, or a distinct species, must be determined when more specimens have been examined, or the animals studied. The largest but not characteristic specimen measured *long.* ·91, *lat.* 1·37, *alt.* ·57.

Hab.—Mazatlan; very rare; *L'pool Col.*

Tablet 168 contains 3 specimens, white, yellow and purple.

76. DONAX CONRADI, *Desh.*

Proc. Zool. Soc. 1854, p. 351.—*Rve. Conch. Icon.* pl. 5, sp. 29.

+D. contusus, *Rve. Conch. Icon.* pl. 4, sp. 24.

+D. Californicus, *Conr.* teste *Desh. ms.* B. M. & Col. Cuming: nequaquam, teste *Nuttall.*

+D. culter, *Hanl. Proc. Zool. Soc.* 1845, p. 14.—*Rve. Conch. Icon.* pl. 4. sp. 21.

It is not without the most careful, laborious and often repeated examination of upwards of 1,000 specimens that I have felt compelled to depart from the views of the illustrious Deshayes and the very accurate Hanley, and group together the species above quoted. The D. Californicus, teste Nuttall whose shells were the basis of Conrad's descriptions, is very different from the shells so named by Desh. in the Br. Mus. and Col. Cuming; the former being a smooth, gibbous, subtriangular shell, more like a young D. punctatostriatus, though quite distinct. The name Conradi is preferred to culter which has priority, as expressing the adult form, and as leaving contusus and culter for the use of those who believe in the species, without introducing confusion. The shells wrongly called D. Californicus are simply the white variety of the forms contusus and culter.

This creature loves liberty both in form and colour. The shape is generally transverse, not unlike the large variety of D. anatinus, slightly swollen ventrally, with a flattening towards the posterior end. Sometimes it tapers off at the anterior part, which is then somewhat flattened: sometimes the whole shell

is very gibbous: sometimes subtriangular, and even taking the form of D. punctatostriatus. The lines of growth shew that the adult by no means thinks it necessary to preserve the form of early life: it being very common to observe the posterior part much developed in the young, while it is narrowed off in maturity; or the shell is sometimes sub-oval when young, and very transverse afterwards. In colour there are similiar variations; the young shell abounding more in purple, while the adults reserve that colour for the inside, and content themselves with a greenish gray. Or a shell of an ochre yellow when young will change afterwards to a purplish tinge. The prevailing colour is a greenish gray, tinged with purple. This is very bright in the young, very dull in the adult. The purple is often absent in the adult, sometimes in the young; rarely predominant. Ochre yellow sometimes prevails, in the young beautifully shaded into purple or white. The white variety is tolerably common, with gradations into the other colours; and often with irregular rays from the umbo to the anterior margin, which is but rarely seen in D. punctatostriatus. The same colours intensified are seen in the young shells, and noted by Hanl. in his description of D. culter. In these the changes in form are extraordinary; some being nearly triangular, while others take an extremely elongated form, with a posterior ventral sinuation (D. culter, var. *a*, Hanl.); but the intermediate forms are so various that I have not been able to separate them. The middle stage of growth of the gibbous form is D. contusus, *Rve.*, a species described from a single specimen in the Cumingian Collection. The surface of the shell is punctatostriate; with the dots finer and the rows further apart than in the last species. Towards the ventral part they generally subside into plain striæ. On the anterior part, they are often crowded and irregular, having jagged edges or running into little lines which are sometimes confluent. A large lunular portion is smooth. The general aspect of the shell is rather glossy, especially in the young shells. The form contusus often retains the margin marks one after another, giving the shell a tiled appearance. Having examined every specimen under the glass, I am unable to note any constant characters in the markings co-ordinate with the changes of form and colour. The crenations are generally simple, without the broad marginal band conspicuous in D. punctatostriatus, and not shewing the intricate markings at the anterior end. I have observed no specific differences in the interior: the teeth and impressions are as in D. punctatostriatus, making allowance for the greater or less elongation of

the shell: colour generally deep purple, with more or less of white. Epidermis very thin, deciduous. Umbos purple with white spot, occasionally rich orange.

A transverse specimen measures *long.* ·83, *lat.* 1·52, *alt.* ·5.
A subtrigonal one " " ·92, " 1·53, " ·52.
The smallest " " " ·06, " ·08, " ·02.

Hab.—(D. culter) Mazatlan and Acapulco, Col. Cuming.—Mazatlan; common (the adult state rare, perhaps from burrowing deeper in the sand); *L'pool Col.*

Tablets 169–173 contain forms intermediate between this species and D. punctatostriatus.—169, 4 sp. rayed.—170, 4 sp. purplish yellow.—171, 5 sp. purplish white.—172, 7 sp. yellowish.—173, 10 sp. more transverse.

"In the following series (except in the subtrigonal forms) the very young are D. culter, *Hanl.*, and the intermediate ones are generally D. contusus, *Rve.*: the white ones of both forms are D. Californicus, *Desh.* not *Conr.*—Tablet 174 contains 10 sp. with purple tinge predominant.—175, 9 jun. and 2 adult, very transverse, margin sinuous, purplish gray.—176, 9 sp. less transverse.—177, regular form, 1 pair, 2 valves very young.—178, 11 sp. very oval and regular.—179, 12 sp. less transverse, more gibbous.—180, 12 sp. very gibbous.—181, 9 sp. subtrigonal.

Yellowish var: 182, 9 sp. transverse.—183, 7 sp. oval, gibbous.—184, 6 sp. subtrigonal.

Greenish var: 185, 11 sp. transverse.—186, 10 sp. gibbous.—187, 10 sp. subtrigonal.

Greenish white: 188, 12 sp. very transverse.—189, 6 sp. suboval.—190, 7 sp. subtrigonal.

Purplish white: 191, 12 sp. transverse.—192, 7 sp. subtrigonal.

White var: 193, 12 sp. very tranverse,—194, 12 sp. suboval (that marked * is curiously inæquivalve with sinuous margin.)—195, 12 sp. subtrigonal.

Rayed var: 196, 12 sp. very transverse.—197, 18 sp. oval.—198, 12 sp. subtrigonal.

Tablet 199 contains 5 young shells (culter,) with the umbonal spot much developed.—200, 3 sp. (form contusus) yellowish white.—201, 3 sp. yellowish purple white.

In all 292 specimens, no two being exactly alike.

77. DONAX NAVICULA, *Hanl.*

Proc. Zool. Soc. 1845, p. 15.—*C. B. Ad. Pan. Shells.* p. 278. no. 456.—*Rve. Conch. Icon.* pl. 4, sp. 18.

A charming little species, both for its extreme beauty, and the distinctness of its characters. Shell singularly swollen, margin gibbous, scarcely shewing crenations beyond the edge at the anterior end: clothed with very glossy epidermis, beneath which are obsolete striæ. Ordinary colour greenish white, gradually assuming darker shades, often beaked with orange, generally more or less rayed, and ending in dark orange chesnut. Inside from white to fawn, ending in deep purple. Often (not always) with two streaks of purple within and without, bounding the lunular and posterior areas. It varies in the greater or less elongation, and in the ventral margin which is sometimes incurved. One monster was found, shewing more prominent striæ, *long* ·44, *lat.* ·9, *alt.* ·29.

Ordinary size	„ ·3,	„ ·66.	„ .23.
Smallest	„ ·2,	„ ·43,	„ ·14.

Hab.—Gulf of Nicoyia, *Cuming.*—Panama, *E. Jewitt, C. B. Adams.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 202 contains 5 specimens, most common variety, very pale.—203, 3 darker, tipped with orange.—204, 3 darker, slightly rayed.—205, 4 normal state, rather dark, indistinctly rayed.—206, 3 sp. rays more evident, tipped with orange.—207, 3 sp. brownish orange.—208, 3 the same deeper.—209, 3 rich dark brown. 210, the monster.—In all, 28 specimens.

FAMILY MACTRIDÆ.

GENUS MACTRA, *Lin.*

78. MACTRA EXOLETA, *Gray.*

Mag. Nat. Hist. 1837, p. 372.—*Rve. Conch. Icon.* pl. 4, sp. 16.

This exquisitely beautiful species is recognized easily by the angle at the posterior side, and by the great prolongation of the flattened anterior margin, which rises into a sharp keel dividing the lunular portion. It differs from M. alata, *Speng.* (=M. carinata, *Lam.* teste *Rve.* ?) in having no laminar keel on the posterior angle. The epidermis which is deciduous, but closely adherent when fresh, only shews striæ of growth, and gradually fades away towards the umbos which are always

white. The shape is very constant, only occasionally varying in the shortening of the anterior portion. The posterior lateral teeth are extremely small, the anterior of moderate size. Pallial sinus rather small and narrow.—I have seen this shell labeled as from the W. Indies, but without authority. It has probably been mistaken for Lutraria carinata, *teste Gould*, which he gives as the Caribbæan analogue of Lutraria ventricosa, (=Mulinia ventricosa, *C. B. Ad. Pan Shells*, p. 293,) which is given from Panama and Mazatlan. ? Can this be the M. exoleta of Gray. V. *Proc. Bost. Soc. N. H.* iv. 89; a work which, alas! I have not been able to see. In the very young shell, the anterior margin is but little produced, and the posterior tooth is moderately large.

Youngest specimen measures *long.* ·16, *lat.* ·21, *alt.* ·1.
The most ventricose „ „ 2·8, „ 3·73, „ 1·86.
The largest „ „ 3·84, „ 5·33, „ 2·5.

Hab.—Cape Horn [?] and West Columbia, Reeve.—Guayaquil, *Hinds.*—Mazatlan; not uncommon, *L'pool Col.*

Tablet 211 contains 1 very young valve.—212, 3 specimens; one young, of exquisite beauty; one with the epidermis removed, shewing the interior (presented by J. Hibbert, Esq.); the other very large.

79. Mactra (Spisula) fragilis, *Chemn.*

Conch Cab. vol. vi. p. 236, pl. 24, f. 235.—*B. M. Cat. D'Orb. Moll.* p. 56, no. 489.—*B. M. Cat. Sagra Moll.* p. 35, no. 418.
=Mactra ovalina, *Lam. An. s. Vert.* ed. *Desh.* vi. 104, no. 21, (teste *Gray.*)
=Mactra Braziliana, *Lam. An. s. Vert.* ed. *Desh.* vi. 106, no. 27, (teste *Desh.*)
=Mactra oblonga, *Say*, (teste *Rve.*)

Mr. Cuming having compared this shell critically with both larger and smaller specimens in his collection, writes that it certainly belongs to M. fragilis, *Chemn.* (according to *Desh.*) The texture and epidermis are very different from M. velata, *Phil.* of which, for geographical reasons, I had thought it might be the young. It is remarkable for its double posterior ridge, great flatness, and large gape on each side. *Long.* 1·36, *lat.* 1·93, *alt.* ·64.

Hab.—W. Indies, Honduras and St. John's, Mus. Cuming.—Cuba, *Sagra.*—Rio Janeiro, *Lalande, jun.* (teste Lam.)—

Brazils, Rio de Janeiro, Patagonia; "Baie Blanche, *Voy.* no. 130," *D'Orbigny*.—Mazatlan; one specimen was sent, quite fresh, papered up along with the Semeles; *L'pool Col.*

Tablet 213 contains the specimen.

80. MACTRA (MULINIA) ANGULATA, *Gray, ms.*

Rve. Conch. Icon. pl. ix. sp. 34.

This species is known at once from the young of M. exoleta by its stout, subtrigonal growth, the shortness of the anterior portion and the rather distant umbos. The epidermis is extremely thin, gradually passing off towards the anterior portion, as in M. exoleta; but differs in being loose, lying in irregular concentric folds, fringed at the posterior angle. The hinge teeth are large and prominent; lateral ones very finely shagreened. The muscular impressions are singularly close to the margin of the shell; pallial sinus small, oval. ? Can this be the M. donaciformis of *C. B. Ad. (Pan. Shells*, p. 293,) as the true M. donaciformis is given by *Rve.* as from N. Zealand.* This shell seems also to have relations with M. goniata, *Gray, ms. (Proc. Zool. Soc.* 1854, p. 70,) and with M. carinulata, *Desh. (Proc. Zool. Soc.* 1854, p. 67: *Rve. Conch. Icon.* pl. 10, sp. 38), both from the gulf of California: *Long.* 2·25. *lat.* 3·05, *alt.* 1·78.

Hab.—Gulf of California, Reeve.—S. W. Mexico, *B. P. C.*—Mazatlan; a very few specimens were found with M. exoleta: *L'pool Col.*

Tablet 214 contains two specimens; one young with the epidermis perfect; the other adult.

GENUS GNATHODON, *Gray.*

Gnathodon, *Gray, Am. Journ. of Science*, ? 1830.—Rangia, *Desmoul. Ac. Soc. Lin. de Bord.* 1831.—Clathrodon, *Conr. Sillim. Amer. Journ.* 1833.

81. GNATHODON (RANGIA) TRIGONA, *Petit.*

G. t. solidâ, subtrigonali, albâ, epidermide flavescente, posterius rugosâ, indutâ; plus minusve inæquilaterali, parte posteriori angulo ab umbonibus decurrente indistincte separatâ; umbonibus subcentralibus, distantibus, non spiraliter recurvis;

* Reeve however, under M. carinulata, sp. 38, speaks of M. donaciformis as from the Gulf of California. ? Is it authenticated from both localities.

lineis subobsoletis utrinque ad marginem dorsalem decurrentibus, aream rhomboideam ut in Arcâ describentibus; anterius lineis lunulam magnam demonstrantibus: intus dentibus lateralibus subæqualibus, tenuissime rugosis, non striatis; sinu pallii minimo.

The shell differs from the typical species in its regular form and consequent size of the anterior tooth, which in G. ouneatus is very short and bent up. If this be regarded as of generic importance, the name Rangia may be retained for this species. It has somewhat the external aspect of Mactra subtruncata, but the rounded character of the hinge teeth shews its affinities to be with Gnathodon. It has the aspect of a brackish water shell, and the pallial sinus is extremely small. The lines of growth outside are often beaded, which is the more remarkable as the margin is sharp, not crenulated. It varies, like other bivalves, in being more or less swollen ventrally, and less or more produced posteriorly. This constantly variable character among bivalves can hardly be the result of sex, as in the myriads of shells of Veneridæ &c. which I have examined, instead of ranging under two heads, there is every conceivable gradation of form. Indeed one of our most accurate British malacologists denies the separation of sex in the Lamellibranchiata altogether: v. *Clark, Moll. Test. Mar. Brit.* p. 191. *Long.* 82, *lat.* 1·08, *alt.* ·55.

Hab.—Mazatlan; rare; *L'pool Col.*

Tablet 215 contains 4 specimens, the largest and the smallest, and two intermediate ones shewing opposite forms of growth.

Family VENERIDÆ.

The genera in this family are so slightly defined that shells classed in different sub-families by one naturalist will belong to the same genus of another. The most accurate divisions are those proposed by Dr. Gray, which will be found in *Desh. B. M. Cat. Veneridæ*, 1853. Many tiny shells were found among the shell washings, which there has been great difficulty in affiliating, from not having intermediate specimens, and from the change of form and hinge characters between the fry and the adult. It is probable therefore that there are many errors in the young of the following species.

Genus ? Clementia, *Gray*.

B. M. Cat. Ven. p. 197.

82. ? Clementia gracillima, *n. s.*

? C. t. subtrigonâ, tenuissimâ, albâ, diaphanâ, concentrice liratâ, liris rotundis, approximatis; postice prolongatâ. Intus dent. 3-4 *divergentibus, minutis: ligamento vix monstrante.*

This shell comes nearer to Clementia than to any other genus I know; nor is there any reason why it should not be found on the American shores of the Pacific. Some may rank it with Tellina. The teeth are more equally divergent than in the typical species. *Long.* ·09, *lat.* ·13, *alt.* ·5.

Hab.—Mazatlan; from backs of Chamæ and Spondylus Lamarckii; extremely rare; *L'pool Col.*

Tablet 216 contains 1 perfect and 2 broken valves.

Genus TRIGONA, *Megerle*.

Trigona, *Megerle*. teste *Desh. B. M. Cat. Ven.* p. 45—*Mühlfeldt*, teste *Woodw. Man. Moll.* pt. 2, p. 305.
=Trigonella, *Conr. Hinds.*
=Cytherea (pars) *Lam.*

Known from Cytherea and Dione by the trigonal shape; numerous irregular cardinal and long lateral teeth; and by the velvety periostraca outside the epidermis, of a dull white colour, which, being mistaken for dirt, is generally very carefully cleaned off by collectors. Under the microscope, this appears like an irregular mass of needle-like crystals.

83. Trigona radiata, *Sow.*

Cytherea radiata, *Proc. Zool. Soc.* 1835, p. 23.—*Hanl. Descr. Cat.* p. 106.—*Sow. Thes. Conch.* p. 619, pl. 128, f. 28—31.—*C. B. Ad. Pan. Shells*, p. 273, no. 446.
Trigona radiata, *Desh. B. M. Cat. Ven.* p. 51, no. 19.
Venus Solangensis, *B. M. Cat D'Orb. Moll.* p. 68, no. 607.
Trigona Byronensis, *Gray, Anal.* t. 8. p. 304, 1838.
=Cytherea corbicula, *Menke* (non *Lam.*) in *Zeit. f. Mal.* 1847, p. 189, p. 54: also *Sow. Thes. Conch.* p. 614, no. 7 (pars), pl. 128, f. 39 (f. 37, 38 excl.)

? + (var.) Cytherea semifulva, *Menke* in *Zeit. f. Mal.* 1847, p. 190, no. 56.

? = (var.) Cytherea gracilior, *Sow. Thes. Conch.* p. 615, pl. 128, f. 32.—(Trigona g.) *Desh. B. M. Cat. Ven.* p. 53, no. 26.

? + (var.) Cytherea Hindsii, *Hanl.* in *Wood Suppl.* pl. 15, f. 39: *Proc. Zool. Soc.* 1844, p. 110.—*Sow. Thes. Conch.* p. 614, pl. 128, f. 27.—(Trigona H.) *Desh. B. M. Cat. Ven.* p. 53, no. 25.

?? + (var.) Cytherea intermedia, *Sow. Thes. Conch.* p. 615, no. 12, pl. 128. f. 35.—(Trigona i.) *Desh. B. M. Cat. Ven.* p. 49, no. 13.

(Compare the Atlantic species T. mactroides, *Born, Chemn. Dillw.* [non *Lam.* nec *Sow.*] *Desh. B. M. Cat. Ven.* p. 51, no. 20: *B. M. Cat. Sagra Cub.* p. 40, no. 476: = C. corbicula, *Lam. Hanl. Phil. Sow.* [pars,] *Gray, Menke* [*Zeit. f. M.* 1849, p. 40, non supra loc. cit.] Also T. Dillwyni, *Desh. B. M. Cat. Ven.* p. 49, no. 14: = C. mactroides, *Sow. Thes. Conch.* p. 615, pl. 128, f. 36 [non *Lam.*]—The W. African analogue is T. tripla *Liu.: Desh. B. M. Cat. Ven.* p. 52, no. 23:—*Menke* in *Z. f. M.* 1849, p. 40.—The Chinese analogue is T. ventricosa, *Gray, B. M. Cat. Ven.* p. 53, no. 24.)

This shell is never so tumid at the umbos [straight] as in the African or [twisted] in the East Indian species: to the West Indian T. mactroides however some forms bear so close an analogy that Menke (and in part Sow.) may well be pardoned for not discriminating them. Menke remarks that "its forms are as various as its fatherland—one should rather say mother-sea." At Mazatlan however its forms and colours vary extremely in the very same mother-sea. It is generally pretty equally swollen, but sometimes much flattened towards the ventral part. Occasionally the whole shell is much compressed, in which state it may possibly be T. intermedia, *Sow.* The ventral line is sometimes well rounded, sometimes nearly straight. Sometimes the posterior part is much produced, occasionally however the anterior. It would be hard to give a specific description that would include all the varieties and yet exclude the W. Indian specimens: the general habit however is so far distinct that I have not felt at liberty to follow Menke in uniting them.* There is often, not always, an anterior gape,

* I have unfortunately distributed several specimens of the white var. of the form T. Hindsii, as another species; but having then examined only about 100 specimens, I thought the velvety epidermis was peculiar to that form and colour. I have since found it however (though it is generally cleaned off) on the typical T. radiata; and after often repeated examinations of some 600 specimens, I am compelled to unite them.

occasionally rather large: the margin is generally thickened in that part, as in Donax. The growth of the teeth is very irregular. The posterior tooth is rugosely crenated in adolescent shells, but in very young ones this is not the case, and in old specimens it is frequently obsolete: in this state it becomes the T. semifulva of Menke. If I have rightly affiliated the young specimens, (·03 across) the creature begins as a suborbicular body, with very swollen and pointed umbos, white with a purplish tinge, the anterior part swollen. There are then only 2 teeth; an enormous anterior lateral, and a small posterior, nearly at right angles. Gradually these lessen in comparative size, while the cardinal teeth are formed one by one, and the creature assumes a trigonal and afterwards a transverse form. The youngest which is undoubtedly T. radiata, (about ·22 across,) has not yet attained its full compliment of teeth, and does not display crenations.—In colour, the shell is generally more or less brown; either in a diffused hue, or in in rays of endless variety, sharp or mottled; straight or zigzag; with the umbos almost always tinged with purple at the tip, with or without a white patch, bifurcate or irregular. Rarely however most of the forms take a uniform dull white, without purple tips. The shell generally forms irregular ridges of growth, as in Dione aurantia.

A transverse specimen measures *long.* 1·72, *lat.* 2·23, *alt.* 1·14.
A thick „ „ „ 1·88, „ 2·3, „ 1·34.
A rounded „ „ „ 1·57, „ 1·82, „ 1.
A produced „ „ „ 1·71, „ 1·97, „ 1·11.

Hab.—Salango and Xipixapi; in sandy mud, 9 fm; *Cuming.*—Ecuador; Xipixapi, *D'Orbigny.*—Panama, extremely rare; *C. B. Adams.*—Mazatlan; very common; *L'pool & Havre Coll.*—(T. Hindsii) Guayaquil Bay, Mus. Cuming.—(T. gracilior) loc. incog.—(T. semifusca) Mazatlan, *Melchers.*—(T. intermedia) California, Mus. Cuming.

Tablets 217—235 *contain specimens arranged to shew variations in form.*—217, 3 sp. very transverse.—218, 3 sp. rather less.—219, 3 sp. somewhat rounded, tumid.—220, 4 sp. very regularly rounded.—221, 1 sp. ventral line flattened.—222, 1 sp. posterior part produced.—223, 1 sp. anterior part produced.—224, 3 sp. gibbous.—225, 3 sp. subtriangular.—226, 4 sp. and a valve, subtriangular, produced anteriorly.—227, 1 sp. extreme form, flat, gaping,—228, 1 sp. with crenations outside, as sometimes in Gnathodon trigona.—229, 1 sp. distorted growth, gaping extremely.—230, 1 sp. mantle cut.

White or very faintly streaked variety.—Tablet 231 contains 4 sp., regular form, various ages.—232, 1 sp. flattened, rounded.—233, 1 sp. produced ventrally.—234, 1 sp. transverse, gaping posteriorly.—235, 1 sp. very transverse.

Tablets 236—241 *are arranged to shew transitions of colour;* but many of the specimens are also remarkable for form.—236, 3 sp. white, with very faint brown markings.—237, 3 sp. brown rays narrow, interrupted.—238, 2 sp. very narrow and numerous rays.—239, 3 sp. with broad, sharp rays.—240, 3 sp. brown predominant.—241, 3 sp. diffused brown.

Tablet 242 contains 6 pairs, extremely young, which probably belong to this species.

Tablet 243 contains 2 young valves, which may belong to the transverse white variety.

84. TRIGONA HUMILIS, *n. s.*

T. t. juniore ovali, umbonibus appressis; ? adultâ parvâ, subtrigonâ, margine ventrali excurvâ, lată; umbonibus non incurvis, parum prominentibus; lævi, vel striis incrementi exilibus: fuscâ, intus maculo purpureo dente postico; dent. lat., antico brevi, solido, postico longo, exili; card. 2-3 parvis; lineâ pallii a margine remotâ, sinu parvâ, subascendente; ligamento celato, brevi; epidermide tenui.

This shell might be taken for the young of Dione chionæa, but for the entire absence of spirally recurved umbos; it differs also from the shells supposed to be the young of T. radiata in the flatness of the umbos and the comparatively small size of the teeth. Not being able to affiliate it with any satisfaction, I have been compelled to describe it provisionally. In the youngest stage only the lateral teeth are prominent, and the shape is almost oval; then the anterior tooth turns round and makes a cardinal, and afterwards the other cardinal teeth appear. There seems always a stain of purple inside the ligament. When adult, it becomes subtrigonal, with the dorsal margins rather straight. Neither lunule nor area are defined.

The youngest specimen measures *long.* ·02, *lat.* ·035, *alt.* ·015.
The largest " " ·11, " ·16, " ·07.

Hab—Mazatlan; rather uncommon, in Spondylus and Chama washings; *L'pool Col.*

Tablet 244 contains 2 pairs united, and 4 pairs of valves of different ages.

85. TRIGONA ARGENTINA, *Sow.*

Cytherea argentina, *Proc. Zool. Soc.* 1835, p. 46.—*Hanl. Descr. Cat.* p. 105:—*Wood's Suppl.* pl. 15, f. 15.—*Phil. Abbild. Conch.* Cyth. pl. 3, f. 5.—*Sow. Thes. Conch.* p. 622, pl. 129, f. 62.—*? Menke Zeitsch. f. Mal.* 1847, p. 189, no. 55.

Trigona argentina, *Desh. B. M. Cat. Ven.* p. 50. no. 16.

This shell may be known at once from those varieties of T. radiata which most approach it by the very remarkable and constant shape; being most regularly excurved along the ventral margin, incurved on the anterior and straight on the posterior dorsal lines. Colour dull white, with light olive green epidermis; often with two rays of violet within. The anterior cardinal tooth is much larger than in T. radiata, and the posterior tooth does not display rugose sulcations. The anterior adductor scar is less deeply impressed and more evenly bounded. *Long.* 2·12, *lat.* 2·6, *alt.* 1·52.

Hab.—Gulf of Nicoyia, in sand banks at low water, *Cuming.*—? Guaymas, *Lieut. Green*, (Gould ms.*).—Mazatlan; *Melchers.*—Do. very rare; *L'pool & Havre Coll.*

Tablet 245 contains 3 minute valves, the smallest ·04 across, which may belong to this species.

Tablet 246 contains 2 specimens. The smallest displays the violet rays, and an abnormal lamina within.

86. TRIGONA ?? CRASSATELLOIDES, *Conr.*

Ann. Nat. Hist. Soc. Philad. t. 7, p. 253, pl. 19, f. 17.—*Hinds, Voy. Sulph. Moll.* p. 65, pl. 21, f. 1.—*Desh. B. M. Cat. Ven.* p. 46, no. 1.

Cytherea crassatelloides, *Hanl. Descr. Cat.* p. 106:—*Wood Suppl.* pl. 15, f. 32.—*Sow. Thes. Conch.* p. 612, pl. 127, f. 1—3.

Tablet 247 contains 2 small valves, (the smallest ·04 across) which have the shape and thickness of this species. Their identity however is doubtful; T. crassatelloides belonging strictly to the Californian fauna, where it attains a diameter of 5 inches. *(Woodw. Nutt.)*

* Dr. Gould writes "Venus straminea, Conr. = argentina ?" Tapes straminea, Conr. is the Californian representative of T. histrionica or T. grata. It is probable therefore that our shell is meant, as Tr. argentina is a well known and constant form. It is possible however that it may not be known to Gould, and that the first shell is meant; also that Menke's Cytherea argentina is one form of T. radiata.

Hab.—Sta. Barbara; *Nuttall, Col. Jewett.*—San Diego; *Lieut. Green.*—Mazatlan; *Lieut. Green.* (Gould ms.)—?? do; from shell washings; *L'pool Col.*

87. TRIGONA PLANULATA, *Brod. & Sow.*

Cytherea planulata, *Zool. Journ.* vol. v. p. 48.—*Sow. Gen.* f. 2.—*Rve. Conch. Syst.* vol. i. p. 94, pl. 69, f. 2.—*Hanl. Descr. Cat.* p. 105.—*Zool. Beech. Voy.* p. 151, pl. 43, f. 6.—*Sow. Thes. Conch.* p. 618, no. 20, pl. 127, f. 13.

Venus planulata, *B. M. Cat. D'Orb. Moll.* p. 66, no. 587.

Trigona planulata, *Gray Cat. Cyth. Anal.* vol. viii. p. 304.—*Desh. B. M. Cat. Ven.* p. 48, no. 8.

+Var. suffusa, *Sow. Proc. Zool. Soc.* 1835, p. 46.

+Cytherea undulata, *Sow. Thes. Conch.* p. 618, no. 21, pl. 127, f. 12.—*(Trigona u.) Desh. B. M. Cat. Ven.* p. 48. no. 9.

=Donax Lessoni, *Desh. Enc. Méth.* vers. t. 2. p. 99.

=(teste *Desh.*) Cytherea mactroides, *Lam.* (non *Born* nec *Sow.*) *An. s. Vert.* vol. vi. p. 307, no. 27.—*Deless. Rec. de Coq.* pl. 8, f. 2.—*Hanl. Descr. Cat.* p. 99: *Wood Suppl.* pl. 13, f. 17.

The very illustrious Deshayes in his later works seems much more disposed to the multiplication of species than he was in his earlier edition of Lamarck. He follows *Sow. jun.* in dividing the C. planulata of *Brod. & Sow.* The C. undulata is discriminated by its more equal form, greater solidity, absence of posterior gape, distinctness of lunule and style of painting. I have not found any one of these characters constant. The species varies almost as much as its more swollen congener, T. radiata. In form there is a gradual passage between the two. The undulatæ are if anything thinner than the planulatæ. The breaking up of the coloured rays proceeds by insensible gradations, and the colouring of the interior varies greatly. The gaping is either posterior, or anterior, or both, or somewhat ventral, or none, just as it happens. The beaks are scarcely ever tipped with purple. The painting of the two valves does not always correspond. The teeth are very small and angular; anterior lateral much prolonged. The W. African analogue is T. bicolor, *Hanl.*

Typical form measures *long.* 2·, *lat.* 2·3, *alt.* 1·.
Var. undulata „ „ 1·78, „ 2·2, „ ·88.

Hab.—Panama, *Cuming.*—Chili; Coquimbo; *D'Orbigny.*—Found abundantly near Mazatlan; *Lieut. Belcher.*—Mazatlan; not common; *L'pool Col.*—Var. suffusa; Salango, sandy mud, 9 fm. *Cuming.*—Var. undulata, do. *Cuming.*

Tablet 248 contains 3 young specimens; dull ash colour, slightly rayed, one with slight gape.—249, 1 sp. adolescent, closed, slightly rayed on one valve, the other mostly dull brown.—250, 1 sp. larger, closed, margin waved.—251, 1 fine adult sp. gaping posteriorly and ventrally.—252, 2 sp. very slightly gaping, rays clouded.—253, 1 do., form undulata, gaping nearly all round.—254, 2 do. form and colouring intermediate; one gapes posteriorly, the other ventrally.—255, 2 pairs and 2 valves, form undulata, large posterior gape.—256, 3 do. valves closed; of which one is nearly white inside, another of a rich diffused violet. Similar differences of colour may be observed in the other specimens.

Genus DOSINIA, *Scopoli.*

Dosinia, *Scop. Intr. ad Hist. Nat.* p. 399, (1777).—*Desh. B. M. Cat. Ven.* p. 5.
Artemis, *Poli, Test. utr. Sic.* p. 98, t. 1. (1791).

88. Dosinia ponderosa, *Gray.*

Artemis ponderosa, *Gray Anal.* (1838), vol. viii. p. 309.—*Rve. Conch. Icon.* pl. 1. f. 4.—*Hanl. Descr. Cat.* p. 109, pl. 19, f. 38.—*Sow. Thes. Conch.* p. 656, no. 3, pl. 140, f. 2.
Dosinia ponderosa, *Desh. B. M. Cat. Ven.* p. 7, no. 5.
Cytherea gigantea, *Phil. Abbild. Conch.* Cyth. p. 33, pl. 7, f. 1. p. 9, no. 7.
Venus cycloides, *B. M. Cat. D'Orb. Moll.* p. 67, no. 596.

A single specimen in beautiful condition, after being referred to D. concentrica (Gulf of Mexico), and D. distans (unknown; probably Puerto Portrero), was at last doubtfully affiliated to this species by Mr. Cuming. A larger specimen procured since from another dealer, and probably from the same collection, confirms the judgment. It is remarkable for the very orbicular form, slightly angulated beyond the ligament; deeply cut lunule; and very regular and distant sulci, not obsolete in the middle, of which, measuring from 1 to 1·5 in. from the umbo, there are only 8. The epidermis is extremely glossy, of a very light straw colour. *Long.* 1·64, *lat.* 1·74; *alt.* ·73.

Hab.—Gulf of California, in sandy mud at low water, Sowerby. —Peru; Payta, *D'Orbigny.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 257 contains the specimen.

89. Dosinia Annæ, *n. s.*

D. t. compressâ, elongatiore, marginibus æqualiter arcuatis: sulcis concentricis subdistantibus, haud impressis, medio subobsoletis; lunulâ oblongâ, subimpressâ; lacteâ, epidermide flavescente, mediô tenuissimâ; dentibus haud valde divergentibus: sinu pallii haud magno, angulato, apice ad marginem ventralem musc. adduct. ascendente.

This fine, and (for a Dosinia) well marked species is known from D. ponderosa by its greatly elongated form; from D. Dunkeri by its larger size, flatter growth, smoother ribs (the difference being at once perceived by drawing the nail along the two shells) which are obsolete in the middle; and especially by the shape of the pallial sinus, which in D. Dunkeri almost always points to the middle, in this towards the ventral edge of the anterior adductor. *Long.* 2·44, *lat.* 2·35, *alt.* 1·12.

Hab.—Mazatlan; very rare; *L'pool Col.*

Tablet 258 contains a young and a full grown specimen.

90. Dosinia Dunkeri, *Phil.*

Cytherea Dunkeri, *Phil. Abbild. Conch.* Cyth. p. 4. no. 5, pl. 2, f. 9. (Oct. 1844.)

Artemis Dunkeri, *Rve. Couch. Ic.* pl. 6, f. 34.—*Ad. & Rve. Voy. Samarang*, p. 78, pl. 21, f. 17.—*Sow. Thes. Conch.* p. 657, no. 7, pl. 140, f. 5.—*C. B. Ad. Pan. Shells.* p. 274, no. 448.

Dosinia Dunkeri, *Desh. B. M. Cat. Ven.* p. 8, no. 9.

= Artemis simplex, *Hanl. Proc. Zool. Soc.* Jan. 1845, p. 11: *Descr. Cat. Ap.* pl. 19, f. 41.—*Rve. Conch. Ic.* pl. 10, f. 9.—*Sow. Thes. Conch.* p. 657, no. 8, pl. 140, f. 6.—(Dosinia s.) *Desh. B. M. Cat. Ven.* p. 9, no. 11.

Cytherea Pacifica, *(Mus. Berol.) Trosch.* in *Wiegm. Archiv.* p. 324, (non Dillw.)

After very patient but altogether ineffectual attempts to separate D. simplex of the monographs from D. Dunkeri, in the many hundred specimens which have passed under review, I am informed by Mr. Hanley himself that his species is the same as Philippi's; and as the name of the latter bears date a few months earlier, it is necessary to preserve it. The shell is known by its very rounded, inflated form, more or less produced ventrally; the more produced form is the D. simplex of the monographs. It varies somewhat in the closeness of the striæ,

but with these exceptions is tolerably constant in character. Colour white, with thin light straw-coloured or yellowish epidermis.

A typical specimen measures *long.* 1·73, *lat.* 1·76, *alt.* 1·04.
A produced „ „ „ 1·7, „ 1·68, „ ·92.

Hab.—Pacific shores of Mexico, Philippi.—Panama, St. Elena, Mus. Cuming, (Hanl.)—Panama, not common, *C. B. Adams.*—Eastern Seas, *A. Adams.*—Mazatlan; very common; *L'pool & Havre Coll.*

Tablet 259 contains 5 young specimens, the smallest ·81 across.—260, 5 do. adult.—261, 5 do. jun. closer striæ.—262, 5 do. adult.—263, 6 sp. distant striæ.—264, 5 sp. adolescent, produced form.—265, 4 do. adult.

Genus CYCLINA, *Desh.*

Cyclina, *Desh. Traité Elém.* (1849) i. pl. 14 bis, f. 20—22.—*B. M. Cat. Ven.* p. 29.

As the animal of this genus is said by Gray to be like Dosinia, while that of Lucinopsis *(Forbes & Hanl. Br. Moll.* 1848, vol. i. p. 433) is very different, being closely allied to the Tellinidæ, *(Clark, Moll. Test. Mar. Brit.* pp. 132 et seq.) both genera will have to be preserved; and the location of different species must await our knowledge of their animals.

91. Cyclina subquadrata, *Hanl.*

Artemis subquadrata, *Proc. Zool. Soc.* 1845, p. 11:—*Descr. Cat.* App. pl. 15, f. 39—*Rve. Conch. Icon.* pl. 3, f. 15.—*Sow. Thes. Conch.* p. 661, pl. 141, f. 27.
Lucinopis subquadrata, *P. P. C. Cat. Prov.*
Cyclina subquadrata, *Desh. B. M. Cat. Ven.* p. 31, no. 4.
= Arthemis saccata, *Gould, Proc. Bost. Soc. Nat. Hist.* 1851, p. 91:—*Mex. & Cal. Shells,* p. 23, pl. 15, f. 2.—(Artemis s.) *C. B. Ad. Pan. Shells,* p. 275, no. 449.—Cyclina s.) *Desh. B. M. Cat. Ven.* p. 32, no. 9.*

This shell agrees in form and muscular impressions with Lucinopsis, but the teeth are those of Cyclina. The young shell is much more orbicular in form. I picked a valve from a collection of W. Indian shells which exactly resembles this species in all respects except the anterior muscular impression, which

* Having just received the type specimen of A. saccata, through the great kindness of Dr. Gould, I can speak to its exact identity.

is somewhat nearer to the hinge, with the sinus less ascending. Epidermis extremely thin. *Long.* 1·51, *lat.* 1·54, *alt.* ·8.

Hab.—St. Elena, West Columbia [?] very rare, Mus. Cuming. (Hanl.)—Panama, extremely rare; *C. B. Adams.*—Mazatlan; *Lieut. Green.*—Mazatlan, extremely rare; *L'pool Col.*

Tablet 266 contains the largest specimen.

Genus DIONE, *Megerle.*

Dione, *B. M. Cat. Ven.* p. 54. = Cytherea (maxima pars), *Lam.*

Known by the smooth posterior teeth, ovate transverse form, and large horizontal pallial sinus.

92. Dione aurantia, *Hanl.*

Cytherea aurantia, *Hanl. Sp. of Shells, Append.*: *Wood Suppl.* pl. 15, f. 20.—*Sow. Thes. Conch.* p. 228, pl. 132, f. 97 bis.
Chione aurantia, *Gray, Analyst,* viii. 305.
Dione aurantia, *Desh B. M. Cat. Ven.* p. 56, no. 3.
Cytherea aurantiaca, *Sow. Gen.* f. 3.—*Rve. Conch. Syst.* pl. 69, f. 3.—*Jay's Cat.* p. 35.—*C. B. Ad. Pan. Shells,* p. 272, no. 414.

This magnificent and typical species appears to belong to the N. W. tropical province. The shape in regularity more nearly coincides with D. chione than with D. chionæa. It is however larger and heavier; less transverse, lunule less marked, and shewing a tendency to irregular concentric ridges of growth. The trifurcate white mark at the umbos has shorter and broader rays. The colour is a light salmon with occasional concentric bands of darker, in the young shell generally white at the margin; covered with a uniform, rather thin, adherent, dark orange epidermis. Inside white, with purple stain on the ligamental portion. Anterior adductor deeply impressed: the rest nearly as in D. chione. I have not been able to trace Sow.'s "obscure biangulato, &c." copied by Desh. *Long.* 3·62, *lat.* 4·28, *alt.* 2·37. A specimen from S. W. Mexico is somewhat larger.

Hab.—Gulf of Nicoyia, Jay.—Taboga, very rare, *C. B. Adams.*—South America [?; non D'Orb. nec Cum.]; Acapulco; Deshayes.—S. W. Mexico, *P. P. C.*—Mazatlan; *Lieut. Green.*—Do. not common; *L'pool Col.**

* "Brazil;" Manchester Mus., without authority; probably an error.

Tablet 267 contains 2 minute valves, the smallest ·03, across, which may belong to this species.

Tablet 268 contains 2 young specimens.—269, 2 sp. very large.—270, a distorted sp. with one valve overlapping.—271, another distorted sp. with a large anterior gape.

93. DIONE CHIONÆA, *Menke.**

Cytherea chionæa, *Menke* in *Zeit. f. Mal.* 1847, p. 190, no. 57.
Cytherea squalida, *Sow. Proc. Zool. Soc.* 1835, p. 23.—*Hanl. Descr. Cat.* p. 101: *Wood's Suppl.* pl. 13, f. 40.—*Sow. Thes. Conch.* p. 629, pl. 131, f. 87-89.—*C. B. Ad. Pan. Shells*, p. 273, no. 447.
Chione squalida, *Gray Cat. Cyth. Anal.* 1838, viii. 306.
Venus squalida, *B. M. Cat. D'Orb. Moll.* p. 68, no. 609.
Dione squalida, *Desh. B. M. Cat. Ven.* p. 58, no. 6.
+ Cytherea biradiata, *Gray, Zool. Beech. Voy.* 1839, p. 151, pl. 43, f. 5.—*Siebold.* in *Wiegm. Arch.*
+ Cytherea chione, pars, *Sow. Thes. Conch.* p. 629, no. 59.
? = Cytherea elegans, *Koch.* in *Phil. Abbild. Conch. Cyth.* 1844. p. 2 (150) pl. 1, f. 4.

For a full description of the main features of this shell, v. Cytherea chione, *Forbes & Hanl. Br. Moll.* i. 396—8, which applies in most of the minute particulars, even in that which is said to separate it, the 3 short ray-like colourless markings of which the central is the shortest, and the others margin the commencement of the lunule and the ligamental area. It is necessary however to state, for the benefit of those who think

* The learned have hardly behaved well to this exquisitely beautiful species. It was first described from some Peruvian shells of a "very dull and dirty aspect," by Sow., under the name (very inappropriate to the species generally) of C. squalida. He confesses however that one of the varieties is "rather agreeably ornamented with concentric purple bands." The Mazatlan shells were next described by Gray, in the Zool. Beech. Voy., as C. biradiata, a name applicable again only to a portion of the species. The East Indian shells were next named by Koch and described by Phil. in 1844 as C. elegans. Then Sow. jun. in 1851 gives in quotations (as though from the P. Z. S.) a fresh description of C. squalida, with only 6 of the original words, adding with singular inappropriateness "*rubente*-albicante radiata; *costellis* numerosis, concentricis, obtusis, concinnis, confertis." He also tells us (an error which C. B. Ad. very politely exposes) that the species was first named from Philippine specimens brought by Mr. Cuming; and also that the name C. biradiata in Beechey's voyage was given to the Philippine shells. Not content with these errors, he also informs us that Mr. Cumings's Mazatlan specimens belong to the Europæan C. chione.—Last of all Menke gives the name C. chionæa to the Mazatlan species; and though he only describes from a single specimen, it fortunately happens that both name and description are sufficiently comprehensive. As the prior names only apply to portions of the species, the ordinary rules of priority are disregarded in order to retain an expressive name which includes the whole species.

that Cytherea may always be known by the umbonal markings, that in this species they are extremely variable: the white rays take very different directions: or it is not rayed at all: or the white is entirely absent. The colour varies from dark lustrous brown to light grey: sometimes uniform, often biradiate with dark brown, generally more or less spotted in the young shell; occasionally tinged concentrically with red, very rarely with purple or greenish, but never with the reddish chesnut which is very characteristic of D. chione. The inside also is often stained with violet, occasionally with yellow. The principal difference from D. chione is the shape, which is more swollen, almost subangulated in the posterior dorsal portion, the angular line generally ending in a produced posterior margin. These characters however are not constant. There is a spotted variety rather hard to distinguish from its W. Indian analogue, D. maculata, not being less tumid (as Sow. states,) but rather more, and losing the posterior angulation. The pallial sinus in D. chione is generally defined by a somewhat broader line, and is a little more pointed; though I found the shape vary not a little in the many hundred specimens of D. chionæa which I have carefully examined.

The East Indian specimens (if Philippi's figures are correct) have the ligament rather shorter, the lunule longer, and the pallial sinus less angulated. In other respects they exactly agree, and are considered identical by the very accurate Desh.; not, of course, for geographical reasons, by C. B. Ad. If distinct, they will take Koch's name of D. elegans.

If I have rightly affiliated certain very small valves, the young shell (of which the smallest measures only ·02 across) first developes the marginal teeth, leaving the central ones till it gets older. The anterior portion of the shell also is of abnormal size.

The longest specimen measures	*long.* 2·77,	*lat.* 3·58,	*alt.* 1·6.
A transverse specimen „	„ 1·94,	„ 2·54,	„ 1·14.
A rounded specimen „	„ 1·62,	„ 1·87,	„ 1·03.

Hab.—St. Elena, in sandy mud, 6 fm., *Cuming.*—Ecuador; St. Elena, *D'Orbigny.*—Taboga, very rare, *C. B. Adams.*—La Paz, *Lieut. Green.*—S. W. Mexico, *P. P. C.*—Found abundantly at San Blas and Mazatlan, *Lieut. Belcher.*—Mazatlan, common; *L'pool & Havre Col.*—(D. elegans) Philippines, *Cuming.*—Swan River, N. H., Philippi.

Tablet 272 contains 11 small perfect and imperfect valves which probably belong to this species.

Tablet 273 contains 7 sp. of various ages, biradiate.—274, 2 do. gibbous.—275, 2 do. uniform dark brown.—276, 1 do. transverse, very dark brown.—277, 6 do. and 2 valves, rather dark, not biradiate.—278, 6 do. light gray.—279, 3 do. very light, faint rays, young shell speckled.—280, 2 do. greenish tinge.—281, 1 do. purplish.—282, 4 do. concentrically banded with reddish.—283, 4 do. and a young valve, spotted, form like D. maculata.

94. DIONE ROSEA, *Brod. & Sow.*

Cytherea rosea, *Zool. Journ.* iv. 364.—*Zool. Beech. Voy. Moll.* p. 151, pl. 43, f. 7.—*Hanl. Descr. Cat.* p. 104; *Wood's Suppl.* pl. 9, f. 11.—*Phil. Abbild. Conch.* p. 183, pl. 5, f. 6.—*Sow. Thes. Conch.* p. 632, p. 132, f. 108.
Dione rosea, *Desh. B. M. Cat. Ven.* p. 77, no. 71.
Cytherea lepida, *Chénu, Conch. Ill.*

Shell as usual, either more or less produced posteriorly, or swollen ventrally; but in all varieties known from D. lupinaria 1. by the non-development of spines, which alone might be accidental; 2. by the shape, which is much flatter, and generally more produced ventrally; 3. by the colour, in which pinkish brown rather than purple predominates, being uniform over the whole shell; a white streak going along the line of spines without purple at the bases, and a brownish instead of purple patch covering the lunular portion; 4. by the anterior laminæ, which instead of being close together, are only raised here and there, generally at intervals of 4 or 5; 5. by the longer ligament, which is enclosed by a finer ridge, scarcely conspicuous in one valve; 6. by the absence of the line marking the second row of spines and angulating the posterior margin; 7. by the teeth which are less raised, more spreading. The colour within is white with diffused violet, not predominant at the hinge. Extremely rarely there is an attempt at the formation of a knob or two where the second row should be, but never a marking line. The concentric ridges are fine, nearly equal, and rarely evanescent ventrally. The ridge which bears the raised lamina does not necessarily bear the raised knobs. The ridges sometimes bifurcate, but are generally more parallel to the margin than in D. lupinaria. I have examined above 500 specimens, in which I believe the above characters are constant. A large number of them are pierced by predacious gasteropods.

The largest specimen measures *long.* 1·97, *lat.* 2·38, *alt.* 1·06.
A transverse specimen „ „ 1·72, „ 2·11, „ ·87.

Hab.—Found abundantly at San Blas, *Lieut. Belcher*, (Beech. Voy.)—Panama, *Cuming* (teste Sow.: non C. B. Ad.).—Mazatlan; abundant; *L'pool & Havre Col.*

Tablet 284 contains a minute valve, probably belonging to this species, measuring ·06 across.

Tablet 285 contains 7 specimens, normal type.—286, 5 do. dark coloured, transverse.—287, 3 do., brownish tinge.—288, 3 do. laminæ slightly raised; the largest was attacked by a gasteropod, who left his hole unfinished.—289, 3 do. pinker shade.—290, 3 do. more produced ventrally.—291, 3 do. most produced.—292, 3 do. coarse ribs.—293, 3 do. very pale.

95. DIONE LUPINARIA, *Less.*

Cytherea lupinaria, *Less. Cent. Zool.* p. 196, pl. 64.—*Sow. Thes. Conch,* p. 632, f. 111.
Venus lupanaria, *B. M. Cat. D'Orb. Moll.* p. 67, no. 593.
Chione lupanaria, *Gray Anal.* viii. 306.
Dione lupanaria, *Desh. B. M. Cat. Ven.* p. 76, no. 68.
Cytherea Dione, var. *Brod. Proc. Zool. Soc.* 1845, p. 45-6.—*Gray* in *Griff. Cuv. An. King.* pl. 19, f. 1.—*Reeve. Conch. Syst.* i. 95. pl. 71, f. 1.
Cytherea semilamellosa, *Gaud.* in *Deless. Rec.* pl. 19, f. 2.—*Chénu. Concl. Ill.* pl. 9, f. 9.

This shell is sometimes shaped like its well known W. Indian analogue, V. Dione, *Lin.* (Dione Veneris, *Desh.*): but is almost always larger and more transverse. It is known at once by the concentric ridges, which are never sharp and raised as in D. Veneris, but either rounded or sub-obsolete on the ventral part. Many of them (generally every other, or 1 out of 3) become obsolete before reaching the anterior part; the remainder become sharply lamellar, gradually fading off to the lunule, not suddenly ending there as in D. Veneris. The posterior part has two angular swellings, one in the line of the inner spines, the other just beyond the ligament. The inner area, lunule and bases of spines are almost always purple even in the pale variety. There are all shades of colour from white to rich puse or purple. The spines appear very irregularly, sometimes two or more growing together, sometimes leaving a large space without. The young shell has always two rows,

the inner one turned backward. In the adult, this row ceases. The very young shell has none; while in D. Veneris they appear much earlier. The spines in the large row are generally rather straight and very long; one measured *long.* 1·88, and others must have been longer when perfect. The concentric ridges are not always parallel with the margin of the shell, and often bifurcate very irregularly. I have examined carefully nearly 4,000 specimens, almost all of which had fallen victims to the voracious appetites of gasteropods, who drill their holes generally near the apex. Epidermis extremely thin: spines channeled. The spine of the smallest well marked specimen measures ·41; the shell itself *long.* ·49, *lat.* ·59, *alt.* ·31.
The largest (without spines) „ 2·26, „ 2·77, „ 1·5.
The most transverse „ 1·53, „ 2·06, „ 1·03.

Hab.—Salango, in sandy mud, 9 fm.; Tumbez (Peru) soft mud, 5 fm.: *Cuming.*—San Blas (Culf of California), sandy mud, 7 fm., Col. Cuming.—Payta, (Peru,) *D'Orbigny.*—Mazatlan; *Col. Jewett,* (Gould ms.)—Do.; extremely abundant, *L'pool & Havre Coll.*

Tablet 294 contains 2 minute valves, (the smallest ·025 across,) which probably belong to this species, though they shew no trace of spines.

Tablet 295 contains 9 very young specimens, rounder form, with rather coarser striæ.—296, 6 do. rather older.—297, 3 do. adolescent.—298, 2 do. very large.—299, 9 very young, transverse form.—300, 8 do. rather older.—301, 6 do. adolescent.—302, 3 do. adult.—303, 5 young, pale var.—304, 3 do. adult.—305, 4 sp. with extra spines.—306, 1 large do. shewing epidermis.—307, 3 young, spines forming at margin.—308, 3 do. spines strangely curved.—309, 2 do. small spine growing by and in broken large one.—310, 1 adult, with spurs on bottom of spines.—311, 1 do. two spines growing together.—312, 1 do. very crowded spines at margin. In all, 72 specimens.

96. DIONE ? VULNERATA, *Brod.*

Cytherea vulnerata, *Proc. Zool. Soc.* 1835, p. 46.—*Hanl. Descr. Cat.* p. 105.—*Catlow. Cat.* p. 40, no. 116.—*Sow. Thes. Conch.* p. 632, pl. 131, f. 95, 96.
Dione vulnerata, *Desh. B. M. Cat. Ven.* p. 60, no. 15.

Tablet 313 contains 2 minute opposite valves which may belong to this species.

Hab.—Real Llejos, in sandy mud, 6 fm. *Cuming.*—?Mazatlan; 2 valves off Spondylus; *L'pool Col.*

97. DIONÉ ? BREVISPINOSA, *Sow.*

Cytherea brevispinosa, *Sow. Thes. Conch.* p. 632, pl. 132, f. 109.
Dione brevispinata, *Desh.* in *B. M. Cat. Ven.* p. 76, no. 70.

Tablet 314 contains a minute valve which may be the young of this species. It has close concentric rounded ribs, and very strong teeth for the size. Length ·03.

Hab.— Gulf of California, Col. Cuming.—? Mazatlan, jun. 1 valve; *L'pool Col.*

98. DIONE CIRCINATA, *Born.*

Venus circinata, *Born, Test. Mus.* p. 61, pl. 4, f. 8.—*Chemn. Conch. Cab.* vi. 312, pl. 30, f. 311.—*Dillw. Rec. Sh.* i. 169.—*B. M. Cat. Sagr. Moll.* p. 39, no. 474.
Cytherea circinata, *Sow. Thes. Conch.* p. 631, pl. 132, f. 104-6.—*Forbes & Hanl. Br. Mol.* i. 399.
Dione circinata, *Desh. B. M. Cat, Ven.* p. 77, no. 72.
Venus Guineensis, *Gmel. Syst. Nat.* p. 3270, &c.
Cytherea Guineensis, *Lam. An. s. Vert.* ed. *Desh.* vi. 311, &c.
Cytherea alternata, *Brod. Proc. Zool. Soc.* 1835, p. 45.

Tablet 315 contains a small white valve which may be the young of this species: *long.* ·08, *lat.* ·095, *alt.* ·05.

Hab.—Cuba, *Sagra.*—S. Atlantic, Forbes.—Mazatlan, *Capt. Donnel*:—do. *Lieut. Green*, (Gould ms.):—do. one valve and fragments, jun., *L'pool Col.*—Var. alternata, Monte Christi, in sandy mud, 11 fm., *Cuming.*

99. DIONE CONCINNA, *Sow.*

Cytherea concinna, *Proc. Zool. Soc.* 1835, p. 23.—*Sow. Thes. Conch.* p. 630, pl. 132, f. 99, 100.
Dione concinna, *Desh. B. M. Cat. Ven.* p. 74, no. 61.
Comp. D. affinis, *Brod. Proc. Zool. Soc.* 1835, p. 45; *B M. Cat. Ven.* no. 60: and D. tortuosa, *Brod.* id.; *B. M. Cat. Ven.* no. 62.

This shell is coloured in sienna brown and white stripes in about equal proportions, the brown being darker on the ribs and in the lunule. Umbos yellow. Concentric ribs occasionally bifurcating. Pallial sinus, long, narrow, ascending. *Long.* 1·2, *lat.* 1·56, *alt.* ·75.

Hab.—Panama, in fine sand, 10 fm. *Cuming.*—Mazatlan; 1 sp. with D. rosea; *L'pool Col.*

Tablet 316 contains the specimen.

Genus CYTHEREA, *Lam.**

Cytherea, ex parte, *Lam.* 1809, *et auct.*

Meretrix, *Lam.* 1799; *Desh. B. M. Cat. Ven.* p. 34.

This genus, as restricted, is known by the subtrigonal form, crenated posterior and distant anterior tooth, and the very small pallial sinus.

100. Cytherea petechialis, *Lam.*

Lam. An. s. Vert. ed. Desh. vol. vi. p. 299.—*Sow. Gen.* f. 1.—*Hanl. Descr. Cat.* p. 96.—*Wood Suppl.* pl. 15, f. 9.—*Rve. Conch. Syst.* vol. i. pl. 69, 70, f. 1.—*? Sow. Thes. Conch.* p. 619, pl. 129, f. 51.

Meretrix petichialis, *Enc. Méth.* pl. 268, f. 5, 6.—*Desh. B. M. Cat. Ven.* p. 36, no. 4.

The widely extended form to which this shell belongs was distributed by Lam. under the species lusoria, petichialis, impudica, castanea, zonaria var. 1, meretrix and graphica.—Desh. in his edition of Lamarck regarded the 6 last, and C. lusoria probably, as all varieties of one species, differing only in colour, and displaying insensible gradations even in this. In the *B. M. Cat. Ven.* however he publishes them all as distinct (except meretrix which is merged into M. impudica), along with C. fusca, *Koch* in *Phil. Abbild. Conch.* p. 19, pl. 3, f. 1.—Sow. unites C. graphica with C. petichialis, C. fusca with C. lusoria, C. castanea with C. impudica, adding C. formosa on his own authority, and yet "being almost persuaded that" all these, along with C. meretrix, morphina, zonaria, casta and ovum *Hanl.*, "might be united under one name, seeing that they pass imperceptibly into each other, and that in a young state it is almost impossible to distinguish them." If the varieties would arrange themselves into zoological provinces, there would be more hope of finding specific types; but I am unable to find any difference between the Mazatlan shells and those from the China and Japan seas. I found scarcely a dozen specimens in the D. chionæa box of the Liverpool collection; but several more were seen mixed with the other Mazatlan shells in the shop of a dealer who had surreptitiously obtained

* The familiar Lamarckian name ("nom plus convenable," *Lam.*) is retained, because a man ought to be allowed to alter his own work if he can improve it; as he certainly did in this instance, by rejecting a meretricious name for so beautiful a group of shells. There is nothing unchaste in nature: it is only man's corrupt ideas that see unclean images in the purity of God's works.

no inconsiderable a portion of the collection.* These shewed great diversities of colouring; sometimes abounding in the typical dots, sometimes shewing the faintest traces of them. The dots were scarcely ever angulated, according to the description and figures of Sow. The favourite trifurcate white mark at the umbos sometimes darts up long angular rays; in other cases it is extremely small and irregular. *Long.* 2·5, *lat* 2·9, *alt.* 1·4.

Hab.—Indian ocean, Lamarck.—China, Deshayes.—[? C. graphica] Japan, *Dr. Sibbald*, Mus. Cuming.—Mazatlan, very rare; *L'pool Col.*

Tablet 317 contains 5 young valves, from the Chama and Spondylus washings, the larger of which I think certainly, the rest perhaps, belong to this species.

Tablet 318 contains 2 adult specimens, one of which at least was from the box.

Genus VENUS, *Linn.*

Venus, ex parte, *Linn.*, *Lam.*, et *auct.*
Chione, *Megerle*, 1811; *Gray*, 1847; *Desh. B. M. Cat. Ven.* p. 118; (non *Gray*, 1838.)

101. Venus (Chione) gnidia, *Brod. & Sow.*

Venus gnidia, *Zool. Journ.* iv. 364.—*Rve. Conch. Syst.*, pl. 68, f. 5.—? *Gray* in *Zool. Beech. Voy.* pl. 41, f. 3.—*Deless. Rec. de Coq.* pl. 19, f. 1, *a*, *b*.—*Hanl. Descr. Cat.* p. 113, pl. 13, f. 43: *Wood's Suppl.* pl. 13, f. 43.—*Sow. Thes. Conch.* p. 709, pl. 154, f. 25.—*B. M. Cat. D'Orb., Moll.* p. 68, no. 606.—*C. B. Ad. Pap. Shells*, p. 269, no. 437.
Chione gnidia, *Desh.* in *B. M. Cat. Ven.* p. 132, no. 41.

This queen of Veneres flourishes in the greatest luxuriance and magnificence in the Mazatlan seas. Though the texture is not so delicate as that of Ch. amathusia, nothing can exceed the beauty of the concentric frills, which rise at various intervals generally perpendicular to the surface of the shell. On the back, they carry off the radiating furrows: on the front they are beautifully crenated. They generally rise into lamina (sometimes ·23 long) which are occasionally bent up almost

* Before I knew how much the species was divided, I distributed under this name in several of the Mazatlan collections ("Hab. incog.") specimens which properly rank under one of the other groups.

into a tube. The epidermis is extremely thin, but important to preserve the shell, which soon becomes of a calcined appearance without it. The radiating striæ become obsolete in the old shells, but not so much so as in Ch. amathusia. The smallest valve measures ·03 in length: the largest specimen, *long.* 3·5, *lat.* 3·56, *alt.* (without spines) 2·3.

Hab.—Payta, Peru, *Fontaine*, D'Orbigny.—Panama, rare, *C. B. Adams.*—San Blas, Jay.—Mazatlan; *Lieut. Green*, (Gould ms.); extremely abundant; *L'pool & Havre Coll.*

Tablet 319 contains 3 very young valves.—320, 4 young specimens, form somewhat rounded.—321, 3 do. adolescent.—322, 3 do. adult.—323, 3 young, slightly produced.—324, 3 do. adolescent.—325, 2 do. adult, ribs close.—326, 3 do. young, more produced.—327, 2 do. adult.—328, 4 young, rather flattened, with distant laminæ.—329, 3 do. adolescent.—330, 2 do. adult.—331, 5 young specimens set to shew the ventral margin in different stages of growth.—332, 4 do. adolescent.—333, 4 do. adult.—334, 2 sp. shewing the nearest approach to Ch. amathusia, and unnatural longitudinal grooves.—335, 1 sp., ribs not foliated ventrally.—336, 2 do., ribs flattened.—337, 1 do., strongly foliaceous.—338, 1 do., foliations semispinous.—339, 1 sp. deformed growth.—340, 3 do. with irregular ribs. In all 59 specimens.

102. Venus (Chione) amathusia, *Phil.*

Venus amathusia, *Phil. Abbild.* p. 129, pl. 2, f. 4.—*C. B. Ad. Pan. Shells*, p. 269, no. 435.—*Sow. Thes. Conch.* p. 709, pl. 154, f. 26, 27.

Chione gnidia, var. *Desh. B. M. Cat. Ven.* p. 133, no. 41.

+ Chione amathusia, *Desh. do.* p. 132, no. 39.

? = Venus cancellata, *Menke* in *Zeit. f. Mal.* 1847, p. 191, no. 58, (non *Lam.*)

? = Venus succincta, *Val.* in *Humb. Rec. d'Obs.* vol. ii.

I follow Hanl. Sow. and ? C. B. Ad. in regarding this as Philippi's species. It agrees exactly with the description; not with the figure. I have however a very worn young stumpy specimen from S. W. Mexico, which is sufficiently like the figure, especially when it is remembered that figures are not always like the shell. I cannot say that I should have known it even from Sow.'s figure, which is much better. Desh. regards Phil.'s species as distinct, and (with Dr. Gray) considers this a variety of Ch. gnidia. What changes the creatures make

in other places I do not know, except from the picked specimens in Mr. Cuming's Col. He regards the species as distinct. The Mazatlan shells would never have encouraged any one to unite them: neither Collector nor dealers offered to put them together. I have very narrowly examined about 400 specimens of this shell, and more than 600 of Ch. gnidia, nor did I find a single intermediate form. The texture of the shells varies as earthenware from china; Ch. amathusia under the epidermis being glossy, and of a very light brownish purple; Ch. gnidia in the same circumstances having the appearance of a baked shell; dull, and of a darker brown. The concentric ribs are peculiarly lustrous, and are very short and stumpy, rarely shewing any tendency to rise into scales. The radiating striæ are very much fainter, shewing a disposition to gather in twos in the young shell. The lunular portion is much larger, smoother, and of a richer purple. Both species within shew the middle teeth slightly furcate, the pallial line distant from the margin, and the sinus small. Ch. amathusia is generally smaller, more swollen, with a thicker shell and margin; and is more angulated posteriorly. It is represented by Ch. cancellata in the Caribbæan sea, and its young may be the shell so named in Menke's Mazatlan list. The smallest specimen found is 1·5 *in.* long; the largest measures *long.* 2·43; *lat.* 2·74, *alt.* 1·63.

Hab.—? Panama, very rare, *C. B. Adams.*—S. W. Mexico, P. P. C.—Mazatlan; *Lieut. Green*, (Gould ms.)—Do.; common and very fine; *L'pool & Havre Coll.*

Tablet 341 contains 3 specimens, rounded form.—342, 3 do. more angulated.—343, 3 do. close ribs.—344, 3 do. produced posteriorly.—345, 3 do. distant ribs.—346, 3 do. swollen form.—347, 3 do. produced.—348, 3 do. even growth.—349, 1 do. with irregular ribs. In all 25 specimens.

103. Venus (? Chione) ——, *sp., ind.*

This can scarcely be the young of Ch. amathusia, since the shape is very different, being subquadrate. Surface more or less distinctly marked with fine concentric ridges and radiating striæ, sometimes nearly smooth; lunule clearly marked; anterior tooth rather long; pallial line distant from margin; sinus broad, shallow. Colour pink or light green. The largest specimen measures *long.* ·09, *lat.* ·12, *alt.* ·06.

Hab.—Mazatlan; about a score were found in the dirt from the small Olivæ; *L'pool Col.*

Tablet 350 contains 4 pairs decussated.—351, 1 pair and a valve, concentric ridges predominant.—352, 2 pairs, nearly smooth.

104 VENUS (? CHIONE) DISTANS, *Phil.*

Venus distans, *Phil.* in *Zeit. f. Mal.* 1851, (Cassel 1852) p. 126.
? Chione distans, *Desh. B. M. Cat. Ven.* p. 123, no. 13.

Tablet 353 contains a worn valve, with 2 stout concentric ridges, which comes nearest to this species. Length ·07.

Hab.—Panama, *E. B. Philippi.*—? Mazatlan, 1 valve off Spondylus; *L'pool Col.*

105. VENUS (CHIONE) CRENIFERA, *Sow.*

Venus crenifera; *Proc. Zool. Soc.* 1835, p. 43.—*Hanl. Descr. Cat.* p. 118; *Wood Suppl.* pl. 16, f. 30.—*B. M. Cat. D'Orb. Moll.* p. 67, no. 603.—*Sow. Thes. Conch.* pt. 14, pl. 156, f. 73, 74.
Chione crenifera, *Desh. B. M. Cat. Ven.* p. 136, no. 50.
? = V. elevata, *Say* teste *Sow.*
? = V. radiata, *Chemn.* t. 36, f. 386, teste *Sow.*
= V. portesiana, *D'Orb. Voy. Am. Mer. Moll.* p. 556, pl. 83, f. 1, 2, teste *Desh.*

This shell belongs to a group of closely allied species, one of which is from the W. Indies. I am not sure that it is rightly named, but I follow Mr. Reeve's authority. It fits the original description, as others might, but not the figure or notes in Sow.'s *Thes. Conch.* The radiating lines scarcely ever group in threes; the shape is suboval, scarcely beaked; the dorsal area is nearly smooth in one valve, but with the concentric ridges continued over in the other, which overlaps beyond the ligament. Surface very irregularly spotted with light chocolate brown. Concentric ridges (which are more or less close) strongly indented and rather glossy. Pallial sinus small, suboval.—Anterior tooth prolonged, sharp: cardinal, sub-bifid. Largest specimen (worn) measures *long.* 1·64, *lat.* 1·87, *alt.* 1·08.

Hab.—St. Elena, in sand at low water; *var.* Payta (Peru); *Cuming.*—Payta, *D'Orbigny.*—Mazatlan: extremely rare; *L'pool Col.*

Tablet 354 contains a minute valve, *long.* ·05, and some fragments.—355, the most characteristic specimen.

106. VENUS (CHIONE) ? UNDATELLA, *Sow.*

Venus undatella, *Proc. Zool. Soc.* 1835, p. 22.—*Hanl. Descr. Cat.* p. 117.—*Sow. Thes. Conch.* p. 711, pl. 153, f. 22.
Chione undatella, *Desh. B. M. Cat. Ven.* p. 141, no. 68.

Tablet 356 contains a broken very young shell which may belong to this species. Concentric ridges numerous; radiating costæ just beginning to shew near margin: anterior tooth prolonged, as usual in young shells. *Long.* ·04.

Hab.—On the shore, Isle Tres Marias, Gulf of California; Col. Cuming.—? Mazatlan; 1 valve, off Spondylus; *L'pool Col.*

107. VENUS (CHIONE) COLUMBIENSIS, *Sow.*

Venus Columbiensis, *Proc. Zool. Soc.* 1835, p. 21.—*Hanl. Descr. Cat.* p. 119: *Wood Suppl.* pl. 16, f. 2.—*Sow. Thes. Conch.* p. 713, pl. 155, f. 53, 54.—*B. M. Cat. D'Orb. Moll.* p. 68, no. 611.
Chione Columbiensis, *Desh. B. M. Cat. Ven.* p. 136, no. 53.

Shell remarkably solid, with strong ligament; with deep radiating grooves leaving broad flattened ridges which are crossed by fine concentric ridges, slightly elevated, rising and falling with the furrows, rather irregular, evanescent on the ventral portion, and nearly so on the posterior, where the ribs often rise into scales on the line of the ridges. The shells often show here and there concentric risings of growth, the fresh shell being commenced below the other. In one valve the posterior rib is very large, overlapping the other valve beyond the ligament. Lunule defined by a deeply cut line, swollen in the middle, and bent at the margin. In these points, and in the character of the hinge, this species closely resembles Ch. verrucosa; the pallial sinus however is somewhat larger. In more than half the specimens, the prevailing colour is chocolate brown; in the remainder, yellowish white more or less tinged with patches of purplish brown. The young shell is very often white, tipped at the umbos with pink or brownish purple. The smooth ligamental area is always spotted with purple. In the very young shells [?] the concentric ridges are not seen; afterwards they often go nearly across. Colour inside, white,

often purple, especially on the hinge line. The smallest valve is ·03 across; the largest measures *long.* 1·9, *lat.* 2·, *alt.* 1·28.

Hab.—St. Elena, in coarse sand at low water, *Cuming.*—Ecuador; St. Elena, *D'Orbigny.*—S. W. Mexico, *P. P. C.*—Mazatlan; extremely common; *L'pool & Havre Coll.*

Tablet 357 contains 7 young valves, [?], lunule not defined, very faint concentric lines of growth, anterior tooth elongated, as is usual in young Veneridæ.

Tablet 358 contains 7 specimens of the normal chocolate colour.—359, 7 do. with white umbos.—360, 7 do. purplish tinge.—361, 7 do. light coloured, slightly spotted.—362, 7 do. with large patches of dark.

108. Venus (? Chione) ———, *sp. ind.*

Tablet 363 contains 3 small valves, the smallest only ·02 across, smooth and white, which do not accord with any of the foregoing species.

Hab.—Mazatlan; in shell washings: *L'pool Col.*

Genus TAPES, *Megerle.*

This genus, though the type of a sub-family of Gray, (*B. M. Cat Ven.*, p. 159) approaches Venus (Chione, *Megerle, Gray,*) by insensible gradations. The following species may be ranked with either genus. The typical forms have not yet been found in this Zoological province.

109. Tapes histrionica, *Brod. & Sow.*

Venus histrionica *Proc. Zool. Soc.* 1835, p. 41.—*Hanl. Descr. Cat.* p. 119; *Wood, Suppl.* pl. 16, f. 31.—*B. M. Cat. D'Orb. Moll.* p. 67, no. 594.—*Sow. Thes. Conch. p.* 714, pl. 55, f. 52.
Chione histrionica, *Desh. B. M. Cat. Ven.* p. 139, sp. 60.
Tapes histrionica, *Hanl. Col. suo.*

This belongs to a group of very closely allied species, of which T. granulata (*B. M. Cat. Ven.* p. 138,) is the W. Indian analogue, and T. straminea the Californian. It has the form and sculpture of a Tapes, with the teeth and pallial sinus of a Venus. The form varies in the greater or less development of the posterior angle, and in the flattening or rounding of the

ventral margin. The colour is very light brown, more or less spotted or stained with darker in zigzag stripes or blotches. The ligamental area is smooth, and marked off by a decided keel on each side. The keel is almost always painted with spots; even when the rest of the shell is without them. *Long.* 1·34, *lat.* 1·58, *alt.* ·8.

Hab.—Real Llejos & St. Elena, in muddy sand at low water. *Cuming.*—Ecuador, St. Elena. *D'Orbigny.*—Mazatlan; extremely abundant; *L'pool & Havre Coll.*

Tablet 364 contains 7 specimens with dark patches of brown.—365, 7 do. smaller patches.—366, 7 do. very small patches.—367, 7 do. dark markings obsolete.—368, 7 do. with generally diffused shade of lighter brown.—369, 7 do. the same broken up into patches.

110. TAPES GRATA, *Say.*

Sow. Thes. Conch. part 13, p. 699, pl. cli., f. 152: *(non Desh.* in *B. M. Cat. Ven.* p. 170.)

Venus grata, *Say Am. Conch.* 1830, pl. 26 (teste Jay, 36 teste Sow.)

Chione grata, *Desh.* in *B. M. Cat. Ven.* p. 140.

=(teste Desh.) Venus tricolor, *Sow. Proc. Zool. Soc.* 1835, p. 41.—*Zool. Beech. Voy.* p. 151, pl. 41, f. 7.—*Hanl. Descr. Cat.* p. 119: *Wood Suppl.* pl. 16, f. 32.—(Tapes t.) *Sow. Thes. Conch.* p. 699, pl. 151, f. 153.

=(teste Jay) Venus discors, *Sow. Proc. Zool. Soc.* 1835, p. 42.—*Hanl. Descr. Cat.* p. 118: *Wood Suppl.* pl. 15, f. 60.—*B. M. Cat. D'Orb. Moll.* p. 67, no. 600.—*C. B. Ad. Pan. Shells*, p. 269, no. 436.—(Tapes d.) *Sow. Thes. Conch.* p. 698, pl. 151, f. 148-150.—(Chione d.) *Desh. B. M. Cat. Ven.* p. 141, no. 65.

?=Venus Entobapta, *Jonas Zeit. f. Mal.* 1845, p. 66.

?=Venus neglecta, *Phil. Abbild.* ii. 62, pl. 4. f. 3; *(non Gray.)*

This shell differs from T. histrionica in not having the smooth ligamental area nor the enclosing carinæ. The lunule also is less distinct. The large specimen is much more tumid, and more irregularly marked. The hinge teeth are much closer and smaller in proportion, and are very slightly bifid.—Pallial sinus less angulated, smaller. Internal crenations less distinct. An intermediate specimen has one tooth in each valve strongly bifid, and is flattened like T. histrionica. The youngest specimen scarcely displays bifidity, is much more coarsely and regularly marked, and has the pallial sinus rounder. It is

possibly a distinct species, and closely resembles the W. Indian T. granulata. The largest measures *long.* 1·5, *lat.* 1·66, *alt.* 1·06.

Hab.—W. Coast Mexico, Say.—S. W. Mexico, *P. P. C.*—Mazatlan, 3 specimens with T. histrionica, *L'pool Col.*—(T. discors) St. Elena and Guacomayo, in sandy mud, 6-9 fm., *Cuming.*—Ecuador, St. Elena, *D'Orbigny.*—Panama, *Jewett,* (Gould ms.)—? Do.: common, *C. B. Adams.*—Guaymas, *Lieut. Green,* (Gould ms.).—(T. tricolor) Puerto Portrero, in sandy mud, 11-13 fm. *Cuming.*

Tablet 370 contains the small specimen; and 371, the largest.

111. TAPES SQUAMOSA, *n. s.*

T. t. parvâ, subquadratâ, oblongâ, albâ fusco maculatâ; margine dorsali subrecto, postice angulato; costis fortibus ab umbone prominente radiantibus, liris concentricis parte anteriori et ventrali decussatis; parte posteriori liris obsoletis, costis ibi interruptis, squamosis, maxime costâ ligamento proximâ; dentibus 2-3 *cardinalibus divergentibus; sinu pallii subovali; lunulâ impressâ.*

Remarkable for the strong radiating ribs, broken up into scales posteriorly which are very large on the rib next the ligament. On the body of the shell these are decussated with moderately distant raised concentric lines. The young shell has in one valve a long posterior lateral tooth close to the ligament. This shell measures *long.* ·03, *lat.* ·04; the largest valve *long.* ·09, *lat.* ·115, *alt.* ·05.

Hab.—Mazatlan; from washings of Chamæ and Spondyli; extremely rare; *L'pool Col.*

Tablet 372 contains the only 3 valves found.

GENUS ANOMALOCARDIA, *Klein.*

Anomalocardia, *Schum.* 1817, *Essai d'une Méth.* p. 134.—*Desh. B. M. Cat. Ven.* p. 115.
Triquetra, *Blainv.* 1818.
Cytherea, sp. *Lam.*
Venus sp. *Sow. Phil,* &c.

This small group of Veneridæ, consisting of species classed sometimes with Venus, sometimes with Cytherea, is well characterized by its irregular growth and extremely small pallial sinus.

112. ANOMALOCARDIA SUBRUGOSA, *Sow.*

Venus subrugosa, *Sow. Gen.* f. 2.—*Rve. Conch. Syst.* i. pl. 67, f. 2.—*Hanl. Descr. Cat.* p. 116:—*Wood Suppl.* pl. 2, f. 6.—*Phil. Abbild. Conch.* p. 177, pl. 3, f. 6, 7.—*Sow. Thes. Conch.* p. 721, pl. 155, f. 63.—*B. M. Cat. D'Orb. Moll.* p. 67, no. 595.—*C. B. Ad. Pan. Shells*, p. 271, no. 440.

Anomalocardia subrugosa, *Desh. B. M. Cat. Ven.* p. 116, no. 2. =Cytherea subsulcata, *Menke*, in *Phil. Abbild.* (ad fid. spec. ab ipso accept.)

This very variable shell is represented on the Atlantic coast by A. flexuosa. It is very coarse and heavy; generally worn at the umbos. The earlier part of the shell is covered by irregular concentric swellings, which afterwards become evanescent on the ventral portion, sometimes all over. These are crossed by rather deeply cut fine radiating lines, which are generally strongest in the depression which marks off the posterior beak, rarely becoming punctato-striate. This depression however often nearly disappears, and the shell approaches A. subimbricata in form. Sometimes it is much flattened, sometimes remarkably swollen and gibbous; sometimes very transverse, sometimes much produced ventrally. The radiating grooves sometimes cover the flattened ventral margin, which is very finely crenulated within. The lunule is marked by a well-defined line, and nearly smooth. The teeth and ligament are very strong. Colour generally a yellowish or brownish white, almost always with 2-4 (generally 3) more or less broad radiating brown stripes; and the rest often freckled with dots or broken lines. Inside generally with a purple stain about the hinge. Epidermis very thin, very pale or brownish.

A transverse specimen measures	*long.* 1·3,	*lat.* 1·72,	*alt.* ·88.		
An elongated	,,	,,	1·49,	,, 1·78,	,, 1.
A thick	,,	,,	1·48,	,, 1·88,	,, 1·2.

Hab.—Panama, Hanley.—Peru, *D'Orbigny.*—Panama; partly buried in coarse sand among stones or under trees, near half tide level, rare; *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; in extreme profusion; *L'pool & Havre Coll.*

Tablet 373 contains 1 minute valve ·6 across.—374, 6 young specimens, usual state.—375, 6 do. adult.—376, 6 do. more beaked.—377, 6 do. more swollen, produced ventrally.—378, 2 do. shape of A. subimbricata.—379, 6 do. more transverse.—380, 3 do. very tumid var. rounded.—381, 6 do. more transverse.—382, 4 do. beaked.—383, 5 do. flattened var., produced

ventrally.—384, 6 do. rather beaked.—385, 4 do. more transverse.—386, 7 do. transverse form, beak not indented.—387, 6 do. very transverse and indented.—*Groups shewing colour.* Tablet 388 contains 2 sp. *whitish var.* normal.—389, 2 do. transverse.—390, 2 do. flat.—391, 2 do. tumid.—392, 3 sp. *yellowish var.* normal.—393, 3 do. transverse.—394, 2 do. rounded.—395, 1 do. tumid.—396, 3 do. *orange var.*—397, 3 sp. *dark var.* normal.—398, 3 do. elongated.—399, 3 do. rounded.—400, 3 do. tumid.—401, 3 do. form of A. subimbricata.—402, 3 sp. broad bands.—403, 3 do. speckled.—404, 3 do. narrow bands.—405, 2 do. and a valve, bands very faint.

Tablet 406 contains 3 sp. strongly rugose.—407, 3 do. smooth form.—408, 3 do. shewing the inside.—In all 130 specimens.

113. ANOMALOCARDIA SUBIMBRICATA, *Sow.*

Venus subimbricata, *Proc. Zool. Soc.* 1835, p. 21.—*Wood Suppl. App.* pl. 15, f. 57.—*Sow. Thes. Conch.* p. 711, pl. 154, f. 35-38.
Anomalocardia subimbricata, *Desh. B. M. Cat. Ven.* p. 117, no. 4.

Only a very few small pairs and some young dead valves were found of this species, which further south is not uncommon. These few however exhibited remarkable differences. Sometimes the form was regular, sometimes extremely gibbous. Sometimes the concentric folds were rounded; sometimes as though the shell was raised at intervals and a fresh shell begun below; sometimes the radiating ribs were crossed by angular laminæ, as in Ch. amathusia and gnidia. In this state it may possibly be the V. cancellata of Menke's Mazatlan catalogue *(Zeit. f. Mal.* 1847, p. 191); unless indeed that be a young specimen of one of the species above named, from which it may be told by the extremely minute pallial sinus. Very rarely the concentric ridges scarcely appear in the young shell, in which state it might easily be taken for another species. In one very young specimen, on the other hand, the concentric folds are sharp, while the radiating ribs are nearly evanescent. The largest specimen only measures *long.* 1·04, *lat.* 1·1, *alt.* ·77.

Hab.—Puerto Portrero, in fine sand, 13 fm. *Cuming.*—Acapulco, Sowerby.—S. W. Mexico, not uncommon, *P. P. C.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 409 contains 2 minute valves.—410, 5 valves of various forms.—411, the gibbous specimen.

FAMILY ASTARTIDÆ,

Cyprinidæ, *Forbes, Woodw.* This name has been previously appropriated for a family of Fishes. Gray divides it into four families, Carditidæ, Astartidæ, Crassatellidæ, and Glossidæ (Isocardia, *Lam.*)

GENUS CIRCE, *Schum.*

Cytherea (pars) *Lam.*—This genus is ranked with the Veneridæ by *Gray & Desh.*, with Astarte and Cyprina by *Forbes* and *Woodw.*

114. CIRCE MARGARITA, *n. s.*

C. t. minimâ, subovali, inæquilaterali, umbonibus appressis, subrugosis, concentrice liratâ, liris acutis, aream lunulâque indistinctis, ligamento celato: parte anteriori dilatâ, posteriori parvâ; dente laterali antico maximo, altero in valvâ in cardinalem confluente; postico longo, exili: cardinalibus 2-3: impressionibus muscularibus, subæqualibus, lineâ pallii à margine remotâ; albâ flavescente, dentibus purpureis; epidermide tenui.

This genus abounds in the Red Sea, Australia and the East Indies generally. It has not been described from the American coast. I have several species in a collection sent from the U. S. as from S. America; but as nearly all are identical with Australian species, the locality is probably erroneous. The charming little C. margarita however establishes its claim to a place in the genus, by its appressed, somewhat rugose umbos, semi-internal ligament, large anterior tooth, and the pallial line which, though generally indistinct, is certainly not sinuated. It is oval, with very delicate, rather sharp concentric lines, covered with a thin epidermis; sometimes subdiaphanous, sometimes opaque and yellowish inside, with a purple tinge on the teeth. It may be the young of a larger species not yet discovered, but as about a score of specimens were found fresh, nearly of the same size, and with the rugóse portion of the umbos clearly distinguished, it may not improbably be adult. *Long.* ·05, *lat.* ·07, *alt.* ·03.

Hab.—Mazatlan; on Spondylus Lamarckii, very rare; *L'pool Col.*

Tablet 412 contains 1 pair closed; 2 do. open, (the largest and smallest,) and 1 yellowish valve.

115. ? CIRCE SUBTRIGONA; *n. s.*

C. t. parvâ, subtrigonâ, postice longius, margine ventrali ovali; concentrice tenuissime striatâ; umbonibus appressis, subrugosis; ligamento celato; dentibus lateralibus posticis magnis, anticis subapproximatis; impressionibus muscularibus à margine distantibus; albo-lutescente, maculâ fuscâ postice, intus subrugosâ, et lineis divaricatis huc et illuc pictâ; epidermide tenui.

Known at once from C. margarita by its shape which is longest behind; by the very fine concentric striæ; the large posterior tooth (not so large however proportionally as the anterior tooth of C. margarita;) and the painting, which displays a large irregular brown patch inside, which projects somewhat above the regular level and is slightly rugose, and a few irregular zigzag lines on a yellowish white ground. I have not been able to trace the pallial line. There is no trace of sinus, though the colour markings sometimes give an erroneous appearance of it. In other respects the generic characters are satisfactorily marked. It is somewhat less uncommon than C. margarita, though I found very few fresh specimens. This greatly exceeds it in size. *Long.* 08, *lat.* 11, *alt.* 04.

Hab.—Mazatlan; on Spondylus Lamarckii, rare; *L'pool Col.*

Tablet 413 contains 2 minute valves, cardinal teeth not formed; 2 adolescent and a pair united; and 2 valves adult.

GENUS GOULDIA, *C. B. Adams.*

As I have neither had the good fortune to find the original diagnosis of this genus, nor to meet with any conchologist who understood it, I can only guess what it was meant to include. The late learned and very accurate Prof. Adams, in his description of the following species, gives no account of the teeth. Fortunately however Mr. Cuming possesses and has allowed me to examine type specimens of G. parva and Pacifica, received from the Professor. The former bears a general resemblance to our ? Circe minima: the second is undoubtedly the Mazatlan shell, and is like an Astarte with lateral teeth, such as occur in not a few of the Crag species. A third species is now added, from its general agreement with the second.

116. GOULDIA PACIFICA, *C. B. Ad.*

C. B. Ad. Pan. Shells, p. 275, no. 450.

The only pair found (and that imperfect) was unfortunately smashed just after it had been sketched. It was of a rich lustrous brown like Petricola robusta. The shell has all shades to a dingy white. About 18 odd valves were found, by no means constant in their characters. The general appearance is remarkably like a little fossil Astarte noticed in a communication made to the British Association, L'pool, 1854, (v. *Report*, p. 78,) flat, triangular (in that respect alone like Tellina Burneti) and with very distant ribs outside. These ribs are generally sharp, but sometimes rather flat and rounded. The anterior dorsal margin is concave in young specimens. The surface of the shell appears under the glass, covered with fine radiating striæ; but under the microscope these lines are found to be simply the divisions between rows of parallel oblong dots, which most resemble the strung figs of commerce, and are laid in rows, side by side, over the surface of the shell. These show through in very young specimens, and present a most beautiful appearance. Inside, one valve has a long anterior lateral tooth, a short distant posterior one, and 3 narrow divergent cardinal teeth, of which the middle one lies between two broad pits, and the anterior joins on to the lateral. The other valve displays a long posterior, and small distant anterior lateral; with 3 cardinals, of which one is the beginning of the posterior lateral, the middle rises between two pits, and the anterior is marginal, nearly obsolete. Muscular and pallial marks distant from margin. The largest valve measures *long.* ·16, *lat.* ·18, *alt.* ·05.

Hab.—Panama; not common; *C. B. Adams.*—Mazatlan; off Chamæ and Spondylus, very rare; *L'pool Col.*

Tablet 414 contains 4 valves, of different ages, and a fresh fragment to shew the 'strung-fig' structure.

117. GOULDIA VARIANS, *n. s.*

G. t. minimâ, subtrigonâ, subæquilaterali, formâ plus minusve angulato-rotundatâ, plus minusve elongatâ; albidâ, plus minusve fusco maculatâ; sublævi, striis incrementi, sive costis concentricis paucis seu numerosis; superficie lineis granulosis radiantibus creberrimis cælatâ; umbonibus subspiralibus, haud conspicuis; margine simplici, appresso; dentibus lateralibus

alterâ valvâ postico, alterâ antico magnis, longis; cardinalibus 3-3, quarum medius alterâ valvâ minimus, alterâ maximus; impressionibus muscularibus subrotundatis, lineâ pallii a margine distantiore.

Four or five well characterized species might easily be described from extreme forms of this variable little shell. Like one of the Crag fossil Astartidæ, it has concentric ribs either near the umbo, all over the shell, or not at all. Sometimes in forming lines of growth, it leaves a sharp projecting ridge. Sometimes it is of a somewhat regular Venus shape (especially when young); sometimes it is narrowed and unusually prolonged. Even in its most ribbed form, it differs from G. pacifica in being very much smaller, not so flat, with umbos more spirally projecting, and with the anterior dorsal margin less concave, as well as in having the ribs smaller, and closer. It has the general size and appearance of Astarte triangularis. The colour is generally whitish, with a large anterior brown stain. The teeth are on the plan of G. pacifica, but display specific differences in their comparative size. The surface under a high power displays the strung-fig pattern, but on a very much finer scale than in G. pacifica. Underneath the outer layer, the shell is somewhat granulose. About a score of pairs and more than 200 single valves were found on the large shells. It was not noticed by C. B. Adams at Panama, but it probably finds its way as far South, as I found it on specimens of Murex regius said to come from that place.

The smallest specimen measures *long.* ·03, *lat.* ·035, *alt.* ·015.
The largest „ „ „ ·09, „ ·08, „ ·05.

Hab.—Mazatlan; common in shell washings; *L'pool Col.*

Tablet 415 contains 1 pair and 12 valves ribbed.—416, 4 valves ribbed near the umbos.—417, 6 valves, nearly smooth.—418, 5 valves regularly rounded.—419, 5 valves elongated.

Genus CARDITA, *Brug.*

118. Cardita Californica, *Desh.*

Proc. Zool. Soc. 1852, p. 100.
? = Cardita affinis, *Menke* in *Zeit. f. Mal.* 1847, p. 188; et *Gould* ms.: non *Sow.*

As this is the northern form representing the more tropical C. affinis (*Sow. Proc. Zool. Soc.* 1832, p. 195; v. also *C. B. Ad. Pan. Shells*, p. 264) it is probably the shell quoted as C. affinis

by Menke in his list of Melchers' Mazatlan shells, and by Gould as collected by Lieut. Green at Guaymas. I have C. affinis from S. W. Mexico; but all, even the most minute, specimens from the Mazatlan collection belong to this species. C. Californica differs from C. affinis (as far as my few specimens enable me to judge) in being rather less transverse, less incurved at the anterior ventral part, less narrow and projecting anteriorly, with the ribs rounder, larger, and covered with very large scaly protuberances at the posterior end. The colour also is much redder, and the epidermis lies in much finer concentric lines.

C. Californica begins life in an irregular way without ribs, as a tiny white creature with concentric striæ. The ribs however on appearing soon become very large and well armed. The creature then looks like a tiny Tridacna, with extremely projecting umbos, subtrigonal, and *nearly equilateral*. At this time there is a large, distant, anterior lateral tooth. (There seems a general tendency among bivalves, in their earliest stage, to an abnormal development of the anterior portion. ? Is the foot then more active than the siphons. Gradually the posterior part grows, the colour appears, and the anterior tooth draws nearer (proportionally) to the hinge. There are generally one or two fewer ribs developed in the young than in the adult. The smallest specimen is ·03 across; the largest measures *long.* ·78, *lat.* 1·38, *alt.* ·5.

Hab.—Gulf of California, Mus. Cuming.—Mazatlan; extremely rare adult, rare jun., nestling in crevices of Chamæ, Spondyli, Ostreæ and Perna; *L'pool Col.*—? Guaymas, *Lieut. Green.*

Tablet 420 contains 3 minute valves and 2 pairs jun.—421, a young specimen in situ on the back of a Perna, on which is the lower valve of Discina Cumingii, attached.—422, an adult specimen.

Genus VENERICARDIA, *Lam.*

119. ? Venericardia ————, *sp. ind.*

Tablet 423 contains a minute valve, whose characters are all those of Cardium except the hinge. This however presents a triangular cardinal tooth, with pits for the 2 opposite ones, and an indistinct, closely approximate *anterior* lateral. There is no trace of posterior tooth. The outside is ribbed almost exactly as in Cardium graniferum; but instead of the inter-

stices being pitted, the whole shell is decussated by very fine rather distant concentric ridges, passing over and between the ribs. The large ventral ribs are hollowed in the interior of the shell. *Long.* ·03, *lat.* ·04, *alt.* ·02.

Hab.—Mazatlan; one valve in Spondylus washings; *L'pool Col.*

Genus ?TRAPEZIUM, *Megerle.*

Megerle von Mühlfeld, Entwurf &c. p. 68, 1811:—*Phil. Hand. Conch.* p. 350.
Libitina, *Schum.* 1817.
Cypricardia, *Lam. An. s. Vert.* 1819.

120. ?Trapezium ——, *sp. ind.*

Tablet 424 contains a puzzling little shell, too young to identify even generically. It is shaped like the adult, not the young of Cardita, but entirely without radiating ribs. Shell transparent, subrhombic, irregular, anteriorly truncate, umbos projecting, lateral; valves smooth, with a few regular distant concentric epidermal ridges; inside with a very stout projecting cardinal tooth, fitting between two small ones in the opposite valve, and a posterior lateral tooth in each. Ligament external: no trace of pallial sinus. *Long.* ·02, *lat.* ·04, *alt.* ·03.

Hab.—Mazatlan; 1 pair, in shell washings; *L'pool Col.**

Family CHAMIDÆ.

This aberrant family is placed by Lam. and Woodw. between Unio and Tridacna; by D'Orb. between Spondylus and Ostrea; by Gray between Saxicava and Cardita; by Phil. between Cardium and Lucina. In its adherent mode of life and irregular growth it resembles Ostrea; while its two large adductors and its siphons remove it far away. Both animal and shell have relations with Isocardia (Glossidæ, *Gray*) which was, not so unnaturally as might appear at first sight, associated with it by Linnæus.

* Of the two species of Gouldia in the Cumingian Collection, G. cerina, *C. B. Ad.* is congeneric with the so called 'Circe' minima, not with the G. Pacifica of the same author. Congeneric with the latter species and with G. variana are Crassatella Martinicensis, *D'Orb.*, intermediate in form between the two Mazatlan species, and Crassatella Guadaloupensis, *D'Orb.* the exact analogue of G. Pacifica. For which group the generic name is to be retained, those who have seen the diagnosis must decide.

Genus CHAMA, *(Pliny,) Linn.*

121. Chama frondosa, *Brod. var.* Mexicana.

Chama frondosa, var. *b. Brod. Proc. Zool. Soc.* 1834, p. 149.—*Zool. Soc. Trans.* vol. i. p. 302, pl. 38, f. 1, 2.—*Rve. Conch. Ic.* pl. 1, f. 1 *b.*—*B. M. Cat. D'Orb. Moll.* p. 87. no. 773.
Compare Chama echinata, *Brod.* in *Zool. Beech. Voy.* p. 150, pl. 43. f. 9.—(? = C. echinata, pars, *Brod. Proc. Zool. Soc.* 1834, p. 150:—*Trans. Zool. Soc.* 1835, p. 305, pl. 39, f. 57.—*Rve. Conch. Ic.* pl. 7, f. 35, jun.—*C. B. Ad. Pan. Shells.* p. 254, no. 407.)

The Mazatlan Chamæ were sent in tolerable numbers, and yet so commonly were their surfaces abraded that it is difficult to discriminate the specific characters. The bulk of them are certainly C. frondosa, var. *b*, of Brod. and Rve., but were considered a distinct species by Messrs. Cuming and Hanley. The typical C. frondosa comes as far north as S. W. Mexico *(P. P. C.)* but was not found among the Mazatlan shells. I have not ventured however to describe it as a distinct species, till more is known of its power of local variation.

Shell when extremely young (as shewn by examining the umbos of the smallest valves found, under a half-inch achrom.) somewhat Venus-shaped, with concentric ridges, and a very finely shagreened surface, occasionally passing into very fine radiating striæ: interior as in adult. Many of the shells do not display this structure, but pass at once to the next stage, generally with vaulted spines, sometimes with irregular laminæ. The inner margin at an early state is not crenulated: colour white, gradually developing a rich pink. In its adolescent condition, the interior is of a rich plum purple, irregularly diffused, more or less stained with orange, especially at the teeth. The margin during this period often displays a most minute set of crenulations, within the line of meeting of the valves. All the specimens found in this state had lost their external characters. When properly adult, it is generally covered with very irregular concentric layers rising into lamellæ, rarely into spines, with a tendency to broader foliation in a posterior radiating area, ill defined. The interior crenations become then almost extinct. Colour outside brownish red, within white, more or less stained with the same. Shell attached sideways, generally by about a third of its surface, with very large adductors, and hinge teeth which are more or less serrated; white, bordered with purplish brown. The ligament

is strong, curling round the umbos, like Isocardia, and becoming semi-internal beyond the hinge teeth. All the specimens are dextral. The laminæ are generally finely striated outside. These shells, like those of Spondylus, offered a safe retreat for boring and nestling bivalves and numerous minute Gasteropods. The smallest valve measures ·02 across. That with the largest animal, (shell somewhat thin,) *long.* 4·5, *lat.* 4·25. *alt.* 3·4. The heaviest shell measures externally (though part has been removed) *long.* 5·7, *lat.* 5·, *alt.* 5·; internally (from ligament to margin) *long.* 2·6, *lat.* 2·8, *alt.* 2·2. This, with another smaller specimen attached, weighs 5lb.; and displays a very large and persistent spiral ligamental groove.

Hab.—Gulf of Tehuantepec, Mexico; dredged up from sandy mud attached to Aviculæ, 10 fm.; Mus. Cuming.—Mazatlan; not common; *L'pool & Havre Coll.**

Tablet 425 contains 3 valves, extremely young, exhibiting the shagreened surface at the umbos.—426, 2 do. umbos finely striated.—427, 1 do. umbo spiral, as in young Calyptræadæ.—428, 1 do. concentric foliations developed.—429, 8 valves, a stage older, spiny processes developed, valves inside variously coloured, and surface rugose.—430, 1 pair and 3 valves, a stage older, colour highly developed.

Tablet 431 contains 1 pair young.—432, a specimen with the spiral umbos so enormously developed, as to approach the fossil form Diceras. The umbo of the attached valve makes two loosely spiral whirls, the ligament running up the suture; in length it nearly equals the breadth of the shell, but being filled up with solid matter, would not display itself in the internal cast.

Tablet 433 contains a pair, young, purple and orange, (closely resembling the C. echinata, "very old," figured in Beechey's Voyage.) Margin very finely, and teeth strongly crenate. Outside, with Vermetidæ, Lithophagi, &c.—434, 2 valves attached to each other, pierced by Lithophagi, &c. The outer layer has become eroded, except where the Lithophagi have bored.

Tablet 435 contains a diseased specimen, purple, attacked by Lithophagi, even to the very centre of the teeth.

Tablet 436 contains a finely grown adult specimen, attached to Pinna, with Vermetidæ &c.—437, the sp. with the largest animal.—438, the group with the largest shells.

* A specimen received from Dr. Gould of this species (without reference) is probably the "C. Pacifica" of his list, "Guaymas, *Lieut. Green.*" It may however be the C. Buddiana, *C. B. Ad.*: v. infra.

121, *b*, CHAMA ? FRONDOSA : *var.* FORNICATA.

C. ?frondosa, t. costis numerosis irregularibus radiantibus, squamis fornicatis crebris indutis ; huc et illuc frondosâ ; intus albâ, ad marginem rubro-purpureâ ; margine crenulato ; dentibus ad apicem valde serratis ; epidermide cinereâ ; per totum latus affixâ.

Compare C. Buddiana, *C. B. Ad. Pan. Shells*, p. 253, no. 405 ; Panama, rare ; Guaymas, *Lieut. Green*.

A few specimens differed from the rest of the Mazatlan Chamæ in having the surface (especially anteriorly) covered with radiating costæ, rising into scales which are often semitubular. The colour never displays the rich purple and orange of C. frond. Mexicana, being white bordered with puce. The attachment is more completely lateral ; margins more strongly crenate ; edge of hinge tooth sharply serrate. Shell covered with an ashy epidermis, sometimes olivaceous, not noticed even in young specimens of C. frond. Mexicana. These characters might be sufficient to mark out a species, if constant : but as I find many of the adult specimens that cannot be referred with certainty to either form ; and as each of the characters (except that of the epidermis) is in both forms subject to variation, their claim cannot be regarded as established. The shell seems to have relations both with C. Broderipii and C. Buddiana : on the other hand it sometimes displays posteriorly more of the characters of C. frondosa proper than does the ordinary form. The valves unite so closely that a specimen (attached to Byssoarca) on being opened, two years after being brought to this country, was found full of the soft animal matter, of course in a state of the most fetid decomposition. In the young state it is not to be distinguished from C. frond. Mexicana, and scarcely from C. spinosa. It is also of the same size and habit of growth.

Hab.—Mazatlan ; very rare ; *L'pool Col.*

Tablet 439 contains 2 pairs and a valve, very young.—440, a pair young.—441 a pair well formed, adhering to the inside of a very large valve. The latter is incrusted with Sponge, Vermetidæ, &c., and nestled beneath the umbo two specimens of Byssoarca gradata have found a home. 442, a sp. attached to living Byssoarca pacifica (v. supra).—443, a large specimen, containing in the upper valve Petricola robusta in situ ; in the lower, which had been attached to ? rock by a large surface,

a Gastrochæna truncata in its burrow, and a Petricola robusta which, after penetrating to the ? rock, has flattened itself rather than bore into the harder substance.

122. CHAMA SPINOSA, *Brod.*

Proc. Zool. Soc. 1834, p. 150.—*Rve. Conch. Icon.* in loc.

Three small valves and one pair appear to belong to this species. The valves differ from the young of C. frond. fornicata, in having the entire surface crowded with semi-tubular spines; and in the character of the margin, which is smooth and rounded within, outside with crowded scales one on another, like the base of Hipponyx tessellata. The types and the pair do not display this structure, which appears very characteristic. Hinge teeth comparatively small; muscular scars not very large; colour white, with slight rosy tint at the umbos which are scarcely spiral. *Long.* 1·1, *lat.* 1·1, *alt.* ·08.

Hab.—Lord Hood's Island, *Cuming.*—? Mazatlan; extremely rare; *L'pool Col.*

Tablet 444 contains a valve. The pair will be seen, attached to Ostrea, with Discina, on tablet 20.

123. CHAMA ? EXOGYRA, *Conr.*

One broken pair attached to a pebble, and a valve on Spondylus calcifer in the Liverpool Museum, differ from the rest of the Mazatlan Chamæ in the following particulars. Shell sinistral; ventrally produced; surface roughened and laminated, not spinous; margin smooth, rounded off, slightly crenate outside; teeth long, small, colour reddish brown, without purple. They may belong to Ch. Panamensis, or even to Ch. corrugata, but seem best to accord with this species. *Long.* 1·5, *lat.* 1·17, *alt.* 1·15.

Hab.—Sta. Barbara, San Diego, &c. *Nuttall.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 445 contains the specimen on pebble.

FAMILY CARDIADÆ.

GENUS CARDIUM, *Linn.*

Only two species of this abundant genus were sent in any quantity; the shell washings however proved that many more must exist in the neighbourhood; 5 species being found suf-

ficiently perfect to describe with tolerable accuracy; and fragments of 5 others presenting characters by which they may be hereafter distinguished.

124. CARDIUM (LÆVICARDIUM) ELATUM, *Sow.*

Pro. Zool. Soc. 1833, p. 84.—*Rve. Conch. Ic.* sp. 41, pl. 8, f. 41.

This most magnificent cockle is known at once by its large size, smooth surface, and yellow colour. It has however very faint, nearly obsolete ribs, covering the body of the shell; but even these are not to be seen on a large, distinctly marked, posterior and a smaller anterior portion. About the umbos there are no longitudinal ribs, but very faint concentric ridges of growth. The shell has a decided posterior gape: edges crenated within, except at the smooth parts: posterior lateral tooth in one valve marginal. Epidermis thin, crossed with numerous very fine concentric ridges.

If I have rightly affiliated the young shells, (but there is nothing intermediate between ·11 and 2·63,) in its early state it is somewhat spotted, and much more transverse. The little shells suit better the description of C. Elenense. The teeth vary greatly in size, and the shells in thickness. Some of the young shells under a low power, and all under a high one, display a pustulose surface, which may be traced near the umbos of the smallest distinct specimen of C. elatum. The smallest minute valve is ·03 across; the largest specimen measures *long.* 5·85, *lat.* 4·58, *alt.* 3·92.

Hab.—Guaymas, in sandy mud at low water, Mus. Cuming.—San Diego, *Lieut. Green.*—Mazatlan; not uncommon; *L'pool & Havre Col.*

Tablet 446 contains the smallest and largest distinct specimens.—447, 3 perfect and 2 imperfect valves of C. ? elatum, jun.

125. CARDIUM PROCERUM, *Sow.*

Proc. Zool. Soc. 1833, p. 83.—*Müll. Syn. Test. Viv.* p. 216.—*Sow. Conch. Ill.* no. 61, pl. 50, f. 23.—*Rve. Conch. Syst.* pl. 77, f. 23:—*Conch. Ic.* pl. 10, f. 51.—*Hanl. Descr. Cat.* p. 140.—*Menke, Zeit. f. Mal.* 1847, p. 188, no. 51.—*B. M. Cat. D'Orb. Moll.* p. 74, no. 659.—*C. B. Ad. Pan. Shells,* p. 267, no. 433.

This shell deserves favourable regard not only on account of the beauty of its form, but also because it has been quoted in

no fewer than eleven books without a synonym! The young shell however has not been so well treated, being, according to Jay and Reeve, the C. laticostatum of *Sow.* It certainly suits exactly the description and measurements given in *Proc. Zool. Soc.* 1833, p. 85. Mr. Cuming however states that C. laticostatum is distinct and is the larger of the two! The young C. procerum moreover is not to be distinguished from the figure of the young C. Panamense in *Zool. Beech. Voy.* pl. 42, f. 7, which is described by *Sow. Proc. Zool. Soc.* 1833, p. 85, as only 1·5 in. long. The specimens in the Cumingian Collection however are extremely large. The Mazatlan shells are manifestly of one species. It begins life nearly orbicular. A young shell, ·5 in. long, displays 7 close posterior ribs, sharply serrated at the margin, and with rows of tubercles on their summits. The 10 ventral ribs are then subtriangular, rather sharp, minutely dotted at the top, and with the sides and very narrow interstitial spaces finely decussated by concentric ridges which travel up and down over them. The six anterior ribs are very much flattened, and faintly decussated by the concentric lines. Gradually both tubercles and concentric ridges disappear, at an earlier or later period; the ribs then become flattened, and at last on the anterior part nearly pass away. The shell assumes a longer or broader form, with every gradation between. The number of ribs varies from 21—25, and does not depend on the shape. The colour is whitish, variously spotted with reddish brown; inside near the posterior margin, (which is very ringent,) of a rich brownish purple. The ends of the ribs project beyond the margin of the shell at the posterior ventral part, and beautifully interlock. The side teeth are in a very slight curve from the cardinal. Epidermis thin, with very closely concentric ridges.

A broad specimen measures *long.* 2·5, *lat.* 2·2, *alt.* 2·04.
The largest „ „ „ 3·07, „ 2·5, „ 2·22.

Hab.—Real Llejos, in coarse sand 4-6 fm. *Cuming.*—Payta, *D'Orbigny.*—Panama, rare, *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan, *Melchers.*—Mazatlan: common; *L'pool & Havre Coll.*

Tablet 448 contains a minute imperfect valve.—449, broad variety, 5 pairs and a valve, young.—450, do. 3 sp. adult.—451, 4 sp. young, elongated form.—452, 3 do. adult.—453, a curiously deformed valve.

126. CARDIUM ? SENTICOSUM, *Sow.*

Proc. Zool. Soc. 1833, p. 84.—*Müll. Syn. Test. Viv.* p. 218.—*Sow. Conch. Ill.* no. 43, pl. 47, f. 10.—*Rve. Conch. Syst.* pl. 74, f. 10:—*Conch. Ic.* Ind. Card. & Errata.—*Hanl. Descr. Cat.* p. 137.—*B. M. Cat. D'Orb. Moll.* p. 74, no. 658.—*C. B. Ad. Pan. Shells*, p. 268, no. 434.

=Cardium rastrum, *Rve. Conch. Ic.* pl. 16, f. 82.*

?=Cardium muricatum, *Menke* in *Zeit. f. Mal.* 1847, p. 188, no. 50.

Tablet 454 contains a nearly perfect minute valve and 6 fragments of larger shells, which probably belong to this species. The ribs are extremely close, about 40, and bearing traces of grains which are strongest on the anterior side. The smallest fragment has a fine line running down the interstices, which is probably an accidental variety, as I have a specimen of C. echinatum displaying the same structure. C. muricatum is the West Indian analogue.

Hab.—St. Elena, in sandy mud, 6-12 fm. *Cuming.*—Ecuador; St. Elena, *D'Orbigny.*—Taboga; very rare; *C. B. Adams.*—? Mazatlan; extremely rare, in shell washings; *L'pool Col.*

127. CARDIUM ——— *sp. ind. (a.)*

C. t. ? jun. minimâ, orbiculari, costis circiter xl. *approximatis, haud extantibus, graniferis; superficie totâ minutissime quasi arenatâ, dentibus lateralibus haud magnis.*

Two valves and a fragment only were found of this shell, differing from C. punctulatum, *Brod. & Sow., Zool. Journ.* vol. iv. p. 366, in the characters above named. The entire surface appears as though dusted over with grains of sand. It appears to be a young shell: if the adult, when found, have the same characters, it may take the name of C. arenatum. *Long.* ·08, *lat.* ·08, *alt.* ·06.

Hab.—Mazatlan; from Spondylus washings; extremely rare; *L'pool Col.*

Tablet 455 contains a nearly perfect valve.

* "Mr. Reeve's reference to P. Z. S. 1841 for Sowerby's description is evidently a misprint for 1833; and the reference to the same work, 1845, for C. rastrum seems erroneous. Mr. Hanley's reference to Reeve Conch. Syst. pl. 84 is also a misprint for 74." *C. B. Adams, loc. cit.*

128. CARDIUM ———, *sp. ind. (b.)*

Tablet 456 contains a fragment of a shell of moderate size, which may possibly be C. triangulatum, *Sow.* (St. Elena and Isle Plata, *Cuming.*) It has very broad flat ribs, with 2 rows of tubercles on each. These communicate with decussating lines in the interstices.

Hab.—Mazatlan; from shell washings; *L'pool Col.*

129. CARDIUM ———*sp. ind. (c.)*

Tablet 457 contains a fragment of a moderate sized Cardium, having relationship with C. pseudofossile, *Rve. (Behring's Str.)* It is of a dead white, with very close, stout, numerous, rounded ribs, barely nodulous.

Hab.—Mazatlan; from shell washings; *L'pool Col.*

130. CARDIUM ——— *sp. ind. (d.)*

Tablet 458 contains a fragment of a thin white shell with perfectly triangular, rather distant ribs, with flat sides. The interstices are smooth, bounded by clearly marked lines.

Hab.—Mazatlan: from shell washings; *L'pool. Col.*

131. CARDIUM ———, *sp. ind. (e.)*

Tablet 459 contains 2 fragments, something like the last, but coloured, and with the ribs rounded and slightly nodulous.

Hab.—Mazatlan; from shell washings; *L'pool Col.*

132. CARDIUM ——— *sp. ind. (f.)*

Tablet 460 contains 2 minute fragments, with very narrow smooth rounded ribs, very far apart. Interstices broad, smooth, bounded by distinct lines.

Hab.—Mazatlan; from shell washings; *L'pool Col.*

133. CARDIUM ALABASTRUM, *n. s.*

C. t. parvâ, albâ, nitidâ, subdiaphanâ, subæquilaterali, elongatâ; costis circiter xviii., *quarûm quatuor ventrales magnæ, distantes, costellis utrâque subtrigonulatis apicem versus granulatis; interstitiis minutissime decus-*

satis; parte anteriore punctis ovalibus impressis decussatâ; dentibus lateralibus approximatis.

This charming little creature has a general resemblance to a minute C. costatum; but the large ventral costæ are rather rounded, with a little one on each side making them appear somewhat trigonal. The anterior portion is strongly indented with oval pits. The appearances it presents under the microscope vary greatly according to the direction of the light. The young shells have fewer ribs near the hinge, where the teeth are not fully developed; are rather less æquilateral; and are granulose on the ribs. *Long.* ·12, *lat.* ·11, *alt.* ·08.

Hab.—Mazatlan; in Chama and Spondylus washings; extremely rare.

Tablet 461 contains 2 valves, the largest and the smallest.

134. CARDIUM GRANIFERUM, *Brod. & Sow.*

Zool. Journ. vol. iv. p. 367.—*Sow. Conch. Ill.* no. 38, pl. 49, f. 17.—*Rve. Conch. Syst.* pl. 76, f. 17:—*Conch. Ic.* pl. 8, 43.—*Hanl. Descr. Cat.* p. 137.—*C. B. Ad. Pan. Shells*, p. 266, no. 430.—*B. M. Cat. D'Orb. Moll.* p. 73, no. 652.

The smallest valve found, which only measures ·03 across, scarcely shews a trace of teeth. The young shells are nearly rectangular at the posterior end; when older, they are obtuse angled. The interstices between the ribs are decussated by a series of rectangular impressed pits laid transversely. The largest specimen found measures only *long.* ·12, *lat.* ·12, *alt.* ·06.

Hab.—Dug from a depth of about 6 inches in the mud of the Estaro de Mazatlan; *Lieut. Belcher.*—Gulf of Nicoyia and Xipixapi; *Cuming, D'Orbigny.*—Panama, extremely rare, *C. B. Adams.*—Mazatlan; a very few young valves and fragments in the washings of Chamæ and Spondyli; *L'pool Col.*

Tablet 462 contains the largest (imperfect) valve, and two small ones.

135. ?CARDIUM ————, *sp. ind. (g.)*

?C. t. juniore suborbiculari, albidâ, valde inæquilaterali; margine dorsali postice recto, antice concavo; costis circiter xviii. *validis, rotundatis, approximatis, tuberculis latis armatis; dentibus elongatis, lateralibus distantibus.*

A puzzling little shell, of which were found only one minute valve and a larger fragment. Remarkable for the very stout ribs, well armed with coarse tubercles, and for the Lucina-like shape of the dorsal margin. It has about 10 ventral ribs, but the species probably has more when adult. If then of the same shape, it may take the name of C. lucinoides. *Long.* ·04, *lat.* ·04, *alt.* ·03.

Hab.—Mazatlan; extremely rare; in shell washings; *L'pool Col.*

Tablet 463 contains the valve.

Family LUCINIDÆ.

Genus LUCINA, *Brug.*

This genus, so abundant in the Atlantic, and especially in the West Indies, appears very rare on the Pacific coast of America. C. B. Adams records only one species from Panama, and this does not belong to the genus; D'Orbigny none from the West coast of S. America. Reeve describes 3 species (fibula, eburnea, and calculus) discovered by Mr. Cuming, besides L. punctata and muricata, previously known; and L. annulata from ? California. Dr. Gould has another, from Acapulco. Only one small species was at all common in the Mazatlan collection; though there is evidence of the existence of a tolerable number of others. Some of the Lucinæ are not at all constant in their characters; the same species sometimes displaying, or not, radiating and concentric ribs, and having its margins smooth or crenated. Not a few of the species appear to have a very wide distribution; L. occidentalis, *Rve.* (olim pecten) being quoted from the West Indies and Ld. Hood's Island, and L. borealis from the British Seas and the Philippines. Many of the Mazatlan species were found entangled in the byssal mass of the large Modiolæ.

136. Lucina (Codakia) tigerina, *Lin.*

Venus tigerina, *Linn. Syst. Nat.* p. 1133-4.—*Born Mus.* p. 70.—*Chemn.* vii. p. 6, t. 37, f. 390-1.—*Schroeter Einl.* iii. p. 136.—*Mont. Test. Br.* p. 119, t. 4, f. 1.—*Dorset Cat.* p. 35, t. 1, f. 14.—*Dillw. Cat.* vol. i. p. 191, no. 76:—*&c.*

Cytherea tigerina, *Lam. An. s. Vert.* ed. 2, vol. 6, p. 318.—*Turt. Dyth. Br.* p. 164, pl. 10, f. 12.—*Flem. Br. An.* p. 445.

Lucina tigerina, *Desh. Enc. Méth.* vers. t. 2, p. 384, no. 37.—*Sow. Gen.* Luc.—*Desh.* in *Lam. loc. cit.* p. 318, (2).—*Forbes & Hanl. Br. Moll.* vol. ii. p. 64.—*B. M. Cat. Cuba Moll.* p. 41, no. 499.

This abundant W. Indian shell will not be received by many as belonging to the Pacific fauna. I can only say that I found the specimen, papered and numbered in the Dosinia box, perfectly fresh, and bearing every mark of having been taken alive. As further evidence of its lingering existence in these seas, I record finding a fresh valve among a collection from the S. W. Mexican coast. The shells are both exactly like the normal W. Indian type, and differ essentially from its Panama analogue, L. punctata, *Linn. Long.* 1·48, *lat.* 1·6, *alt.* ·58.

Hab.—West Indies, *passim.* (Jamaica, Lister.—Barbadoes, *P. P. C.*—St. Domingo, D'Avila.—Cuba, *Sagra.*)—Amboyna, Rumphius.—Nicobar Is., Chemnitz.—[Britain, *Montague*, &c. ? imported.]—S. W. Mexico, 1 fresh valve, *P. P. C.*—Mazatlan; 1 fresh specimen; *L'pool Col.*

Tablet 464 contains the specimen.

137. Lucina ??punctata, *Linn.*

Venus punctata, *Linn. Syst. Nat.* p. 1134.—*Chemn. Conch. Cab.* vii. p. 15, pl. 37, f. 397-8.

Cytherea punctata, *Lam. An. s. Vert.* vol. vi. p. 319, no. 54.

Lucina punctata, *Desh. Dict. Class. d'hist. nat.* t. 9.—*Sow. Gen.* Luc. f. 1.—*Rve. Conch. Ic.* pl. 1, f. 2.

Tablet 465 contains two minute valves, ·03 across, which are evidently the young of a somewhat large species, perhaps this. One of them has close radiating ribs from the commencement; the other is smooth, with striæ of growth; till, near the margin, after a sharp concentric ridge, it suddenly betakes itself to making longitudinal ribs. The teeth somewhat resemble the young of Dione, with the extreme ones very large in proportion.

Hab.—"L'Ocean des Grandes Indes," Lamarck.—Panama, on the sands at low water, *Cuming.*—?? Mazatlan; jun. extremely rare, in shell washings; *L'pool Col.*

138. Lucina ? annulata, *Reeve.*

Reeve, Conch. Ic. pl. 4, f. 17.

Tablet 466 contains a fragment with rounded concentric ribs, and very fine concentric striæ traveling over both ribs and

interstices, which may belong to this species.

Hab.—?Mazatlan : in shell washings ; *L'pool Col.*

139. LUCINA ? MURICATA, *Chemn.*

Tellina muricata, *Chemn. Conch. Cab.* xi. pl. 199, f. 1945-6.
Lucina muricata, *Rve. Conch. Ic.* pl. 8, f. 46.

Tablet 467 contains a fragment, with extremely fine, close, radiating ribs, rising in concentric lines into sharp scales.

Hab.—?Mazatlan ; in shell washings ; *L'pool Col.*

140. LUCINA EXCAVATA, *n. s.*

L. t. albâ, tenui, complanatâ ; suborbiculari ; striis concentricis exillimis ; postice angulatâ, umbonibus incurvatis ; lunulâ parvâ, alte excavatâ ; dent. card. et lat. haud magnis ; impressionibus muscularibus posticâ ovali, anticâ valde elongatâ ; margine integro.

Distinguished by the very small, most deeply cut lunule, bounded on one side by the cardinal, on the other by the anterior lateral tooth. A larger lunular portion is marked out by a line, and the posterior margin is slightly bi-angulated. Smallest valve ·03 across. Largest, *long.* ·38, *lat.* ·41, *alt.* ·12.

Hab.—Mazatlan ; 2 valves and fragments among shell washings ; *L'pool Col.*

Tablet 468 contains the two valves, and a fragment to shew the external surface.

141. LUCINA ———, *sp. ind.*

Tablet 469 contains a fragment, smooth outside, with the umbo slightly projecting ; inside with a stout round cardinal tooth, and deeply impressed internal ligament pit. I have a very similar species from Port Jackson.

Hab.—Mazatlan ; in shell washings ; *L'pool Col.*

142. LUCINA PECTINATA, *n. s.*

L. t. albidâ, suborbiculari, planatâ, marginibus rotundatis ; costis radiantibus appressis, huc et illuc bifidis, juniore circiter X. *adultâ circiter* XXX. ; *postice non divaricatis ; lineis frequentissimis concentricis a costis undatis ; lunulâ parvâ ; dent. card. et lat. haud magnis ; ligamento subinterno ; impressionibus muscularibus posticâ subrotundatâ, anticâ valde elongatâ.*

Differs from L. cancellaris in being much larger and flatter, with the teeth and lunule smaller in proportion. There is no posterior angle or flattening. The radiating ribs divide as in L. cancellaris, but the concentric ridges, instead of being sharp and standing so as to leave deep pits between, are very close and fine, running up and down across the ribs and interstices. It seems closely allied to L. fibula (St. Elena and Philippines), and to L. costata, *D'Orbigny*, (Brazils.) *Long.* ·44. *lat.* ·49, *alt.* ·16.

Hab.—Mazatlan; one fresh valve and fragment, entangled in the byssus of Modiolæ; *L'pool Col.*

Tablet 470 contains the valve.

143. Lucina cancellaris, *Phil.*

Zeit. f. Mal. 1846, p. 21, no. 7.

Shell, when extremely young, smooth at the umbo, then with stout concentric ridges, then with 8 or 10 very strong radiating rounded ribs crossing them. These branch out into other narrower ones, till there are about 26, strongly cancellated, and leaving deep pits between. "The form closely resembles L. commutata, *Phil.*, which is the real T. divaricata of Linnæus. With L. pecten, squamosa and reticulata *(Poli,* not *Lam.)* it must not be confounded; its strong rotundity, almost equilateral form, and the character of the sculpture at once distinguish them." *(Phil. loc. cit.)* Lunule small, deep: posterior ligamental portion flattened, separated by an indistinct keel. Interior margin deeply crenated; muscular scars (anterior elongated, irregular) rather distant from margin; lateral and cardinal teeth strong. The smallest specimen is ·03 across. The largest, *long.* ·15, *lat.* ·14, *alt.* ·09.

Hab.—Mazatlan, Philippi.—Do.: extremely rare; *L'pool Col.*

Tablet 471 contains the youngest valve and the largest pair.

144. Lucina Mazatlanica, *n. s.*

L. t. parvâ, albâ, suborbiculari, umbonibus antice incurvatis, lunulâ longâ, margine posticâ obscure biangulato; primum liris concentricis, acutis, plus minusve distantibus; postea radiis quoque rotundatis, creberrimis, ad marginem decurrentibus; liris ad angulam posticam quibusdam obsoletis, reliquis extantibus; areâ posticâ subplanatâ; dentibus card. parvis, lat. subdistantibus; ligamento curto, subexternò; impressionibus muscularibus haud elongatis; margine (haud semper) crenato.

Though 200 valves were found, many of them fresh from the banquets of carnivorous Gasteropoda, there was only one pair. When young, nothing is seen but the concentric ridges; the shell is then elongated anteriorly, and scarcely to be distinguished from the young of L. prolongata; afterwards it assumes a regular, rounded form, with the posterior part flattened, and bearing fewer but more elevated ribs. The radiating ribs first appear at different ages, and are very close and little raised. The margin is often not crenated in the young shell. The smallest valve is only ·03 across; an unusually large one measuros *long.* ·15, *lat.* ·16, *alt.* ·09.

Hab.—Mazatlan; in shell washings, between the ribs of Cardia, in crevices of Chamæ and Spondyli, &c., not uncommon; *L'pool Col.*

Tablet 472 contains the pair, and 14 valves of different ages.

Tablet 473 contains 3 valves, which may be an elongated variety of this species, or the young of L. prolongata.

145. LUCINA PROLONGATA, *n. s.*

L. t. parvâ, flavidâ, solidâ; antice, maxime prolongatâ: marginibus rotundatis, lunulâ longâ, umbonibus antice incurvatis; liras concentricas rotundatas plus minusve monstrante; intus dent. crassioribus, lat. subapproximatis; impressionibus muscularibus regularibus, subovalibus; margine interno seu planato seu crenulato: ligamento parvo, externo.

Shell somewhat resembling L. calculus, *Rve. (Conch. Ic.* pl. 11, f. 68, taken in coarse sand, 10-13 fm., Gulf of Nicoyia, *Cuming,)* which however is described as smooth, polished, shining white. This is of a yellowish cast; and though the rounded ridges are often nearly obsolete, yet it is never polished. On one specimen were 3 deeply cut concentric sulci. The young shell has its ribs sharper, when it resembles L. Mazatlanica. The posterior part is rounded off. Inside there is a glossy deposit over the mantle part, the margin being very finely rugose. The muscular scars in this species and the last are much more equal than in the typical forms. The smallest valve is ·04 across; the largest measures *long.* ·16, *lat.* ·13, *alt.* ·08.

Hab.—Mazatlan; from the crevices of Chamæ and Spondyli, very rare; *L'pool Col.*

Tablet 474 contains a large and a small pair, and 5 valves differing in age and markings. One, having been bored by a

Gasteropod and then deserted, has made a coating over the hole inside.

146. ? LUCINA ———; *sp. ind.*

Tablet 475 contains a fragment of a pinkish shell with very smooth angular ribs.

Hab.—Mazatlan; in shell washings; *L'pool Col.*

147. LUCINA ? EBUENEA, *Reeve.*

Conch. Icon. Lucina, sp. 49, pl. 8, f. 49.

Tablet 476 contains a young valve of exquisite beauty which may belong to this species, unless indeed it be a Strigilla lenticula. It is of glossy white, and so transparent as to shew the muscular impressions outside, and the external markings within. Suborbicular, with umbo very projecting between two concave margins and nearly central. Surface covered with very crowded concentric striæ, which at the margin shew a tendency to commence divarication. It is ·06 across.

Hab.—St. Elena and Panama, in sandy mud, 11 fm. *Cuming.*—? Mazatlan; one valve in Spondylus washings; *L'pool Col.*

148. LUCINA ———, *sp. ind.*

Tablet 477 contains a fragment of a thin, globose species, with very numerous sharp concentric ridges; interstices decussated by very fine radiating striæ.

Hab.—Mazatlan; fragments of two specimens in shell washings; *L'pool Col.*

GENUS ? FIMBRIA, *Meg.*

Fimbria, *Megerle v. Mühlfeld*, 1811, *Entwurf* &c. p. 52.
Corbis, *Cuv.* 1817, *Régne An.* vol. iii. p. 147.
Idothea, *Schum.* 1817, *Essai.*

149. ? FIMBRIA ———, *jun.*, *sp. ind.*

Tablet 478 contains one of two tiny valves which seem to belong to this genus, having the teeth of Cardium, with con-

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centric ridges slightly decussated. They are evidently young, extremely thin, and shaped like the fossil F. lamellosa. *Long.* ·06, *lat.* ·08, *alt.* ·04.

Hab.—Mazatlan; off Spondylus calcifer, 2 sp.; *L'pool Col.*

Genus DIPLODONTA, *Bronn.*

Diplodonta, *Bronn* 1831, *Italiens Tertiargeb.* p. 9.
Mysia, *Gray, Proc. Zool. Soc.* 1847, p. 195, (non Mysia *Leach*,) teste *Phil.* in *Handb. der Conch. & Mal.* p. 342.
Glocomene, *Leach (a secundâ manu,) Br. Moll.* 313.

For a full account of the remarkable peculiarities of the animal of D. rotundata, v. *Clark Moll. Test. Mar. Br.* p. 82.

150. Diplodonta semiaspera, ? *Phil.*

Quoted by *Philippi*, in *Abbild. Conch.* Tellina, p. 25, under Tellina pisiformis, Aug. 1846.
?=Lucina orbella; *Gould, Proc. Bost. Soc. N. H.* Nov. 1851, vol. iv. p. 90:—*Cal. & Mex. Shells*, p. 22, pl. 15, f. 3.
?=Lucina semireticulata, *B. M. Cat. D'Orb. Moll.* p. 72, no. 640:—*Do. Cuba Moll.* p. 41, no. 498.
?=Lucina cælata, *Rve. Conch. Ic.* pl. 6, f. 27, *a*, *b*.

A small colony was found in a burrow in Chama, old and young, most tightly wedged. They apparently lived on till they smothered each other. The shape of individuals varies extremely. Some are nearly globular, others (smaller) much flattened. Some are solid, some with a glossy shell like Kellia. In some the ligament was conspicuous outside; in others entirely hidden. The outside is sometimes nearly smooth; sometimes with concentric lines of growth, here and there granulose. The ligamental plate is generally more or less turned in; the teeth rather divergent and strongly bifid. The muscular scars are rather long, especially the posterior one, serrated within, and (with the pallial line) near the margin; but even these characters seem to vary in every specimen. The umbo in the very young shell is subcentral, with the ligament entirely external, and the hinge teeth prominent. The smallest specimen measures ·04 across; the largest, *long.* ·41, *lat.* ·42, *alt.* ·28.

After a very careful comparison of the types of L. cælata, L. orbella and D. semiaspera, I am unable to detect differences between them which do not exist between specimens of the

latter. L. cælata is larger, with the rugose markings more coarsely grained; ligament concealed. L. orbella is of the same size and shape, but rubbed smooth, and with the ligament prominent. D. undata is closely related, but differs in having an anterior lateral tooth in each valve, as well as in outline.

Hab.—According to Philippi, loc. cit., this species and Tellina pisiformis are found both at Mazatlan and in the W. Indies.—St. Thomas', *Merk.*—Mazatlan; very rare, nestling in burrows; *L'pool Col.*—(D. orbella) San Diego, *Lieut. Green.*—Sta. Barbara, *Col. Jewett.*—(D. semireticulata) Cuba, *Sagra*:—Brazils; Rio de Janeiro; Patagonia; *D'Orbigny.*

Tablet 479 contains 4 pairs and 2 valves, young and flattened.—480, 2 pairs adult.

150. *(b.)* DIPLODONTA ? SEMIASPERA, *var.* DISCREPANS.

D. ? semiaspera t. tenui, leviori, impressione posticâ subrotundatâ; dentibus elongatis, ligamento omnino externâ.

Tablet 481 contains a solitary specimen, which, had the other shells been at all constant in their characters, would have been considered a distinct species. As it is, it must await the examination of further specimens, especially as L. orbella, *Gould*, appears intermediate between this and the typical form. *Long.* ·29, *lat.* ·31, *alt.* ·021.

Hab.—Mazatlan; 1 sp. in burrow from Chama; *L'pool Col.*

151. DIPLODONTA OBLIQUA, *Phil.*

Zeit. f. Mal. 1846, p. 20, no. 6.

This species is said by Philippi to differ from D. trigonula in being more oblique, with the umbos not so sharp, and the dorsal margin not so straight. The umbo is placed at one third of the entire breadth. *Long.* ·12, *lat.* ·17, *alt.* ·06.

Hab.—Mazatlan, Philippi.—Do.; one worn valve from the Chama washings; *L'pool Col.*

Tablet 482 contains the valve.

GENUS ————

A group of very nearly allied species, described by Reeve and D'Orbigny as Lucinæ, *viz.* Lucina Candeana, (Cuba,) L. cornea, (coarse sand, 10-13 fm., Gulf of Nicoyia, *Cuming,*) L.

nitens, (Is. Muerte, 11 fm., sandy mud, *Cuming*,) L. tellinoides, (do. *Cuming*: Taboga, not common, *C. B. Adams*,) and the following, are placed by Woodward under Diplodonta (Man. Moll. pt. 2, p. 298.) They differ essentially in form and habit from the typical species of that remarkable genus, and have relations (except in the hinge teeth) with Cyrenoides: but until the animal has been examined, it would be presumptuous to create a fresh one for their reception.

152. ? DIPLODONTA SERRICATA, *Reeve*.

Lucina serricata, *Conch. Ic.* pl. 9, f. 25.
Cyrenoida serricata, *P. P. C. Cat. Prov.*

Mr. Reeve tells us that this shell differs from the others essentially in form; but his descriptions and figures often oblige students to take many things on trust. It has much the appearance of a brackish water shell, having a glossy epidermis eroded near the beaks. The allied species are however strictly marine; and even these (though very rarely) are pierced by Gasteropods. The shell is extremely thin, Cyrenoides-shaped, but with the teeth of Diplodonta. Muscular scars elongated, rather irregular. The form is generally elongated, but sometimes nearly round; beaks appressed; ligament subinternal.

The largest specimen measures *long.* ·87, *lat.* ·81, *alt.* ·36.
A rounded „ . „ „ ·72, „ ·73, „ ·31.

Hab.—Mazatlan; not uncommon; *L'pool Col.*

Tablet 483 contains a minute pair, broken, measuring ·07 across and 2 minute opposite valves, ·03 across, from the Spondylus washings, which probably belong to this species. If so, they establish its marine station. The youngest valves, by transmitted light, display a fine radiating fibrous structure.

Tablet 484 contains 6 specimens, varying in age and shape.

FAMILY KELLIADÆ.

The little shells, either overlooked in the days of Lam. or included in the heterogeneous genera Erycina and Amphidesma, are now found to be inhabited by animals greatly differing from each other. The British members, which alone have been carefully studied malacologically, are distributed by Clark (*Moll. Test. Mar. Brit.* pp. 88 et seq.) under the families Kelliadæ, Montacutidæ, Turtoniadæ, Arcadæ & Ana-

tinidæ. The genera also are by no means satisfactorily ascertained; the same shell having been described by Forbes and Hanley as Kellia nitida and Lepton convexum; v. *Br. Moll.* vol. iv., app. p. 255. As the animals of the Mazatlan species are entirely unknown, a systematic arrangement of them is not attempted; and they are simply grouped under genera according to the preponderance of characters.

Genus KELLIA, *Turt.*

Kellia, *Turton Conch. Dyth. Brit.* 1822, p. 56.
Erycina, *Payr.* non *Lam.* (sp.).
Chironia (Laperousii) *Desh. Rev. Zool.* 1839, p. 356.
Bornia, sp., *Philippi, Enum. Moll. Sic.* 1836, p. 13.
Tellimya, sp., *Brown, Ill. Conch. Gr. Br.*

153. Kellia suborbicularis, *Mont.*

Mya suborbicularis, *Mont. Test. Brit.* pp. 39, 564, pl. 26, f. 6.
Tellina suborbicularis, *Turt. Conch. Dict.* p. 179.
Kellia suborbicularis, *Turt. Dith. Brit.* p. 56, pl. 11, f. 5, 6.—*Alder, Cat. North. & Durh. Moll.* p. 93.—*Forbes & Hanl. Br. Moll.* vol. ii. p. 87, pl. 18, f. 9, 9*a*, 9*b*, pl. O, f. 4.—*Searles Wood, Crag. Moll.* (Palæont. Soc.) Part ii. p. 118, pl. 12, f. 8, *a*, *b*. *Clark Moll. Test. Mar. Brit.* p. 89.
Petricola suborbicularis, *Gray, Ann. Phil.* 1825.
Erycina suborbicularis, *Récl. Rev. Zool.* 1844.
Tellimya suborbicularis, *Brown, Ill. Conch. Gr. Br.* ed. 2, p. 106, pl. 42, f. 14, 15.
+ Tellimya tenuis, *Brown, loc. cit.* f. 12, 13.
? + Tellimya lactea, *Brown, loc. cit.* f. 10, 11.—(Kellia l.) *B. M. Cat. Br. Moll.* pt. 7, p. 83, no. 2.—*Loven, Ip. M.* 44, 310.
Erycina Geoffroyii, *Payr. Cors.* 30, pl. 1, f. 3—5.
Amphidesma physoides, *Lam.* fide *Sow.*.*
Bornia inflata, *Phil. Moll. Sic.* vol. i. p. 14, & vol. ii. p. 11.

After often repeated and most careful examinations of many hundred specimens, comparing them with each other and with the very minute description in the *Br. Moll.* as well as with every Atlantic specimen that has been accessible, I am unable to give any specific characters by which the Mazatlan shells

* A. physoides, *Lam.* Erycina ph. *Desh.* The description of this shell (*An. s. Vert.* ed. *Desh.* vi. 130, no. 16,) will fit any similar species. "A. t. orbiculato-globosa, hyalina, vesiculari. Hab. au port du roi George. *Peron.*"

can be separated from the British, or the aberrant forms from each other. The general aspect of the shells from the two localities is sufficiently distinct; the Pacific shell being generally thinner and rather flatter; but the specimens from the Canaries brought by R. M'Andrew, Esq. so remarkably coincide with those from Mazatlan that Prof. Forbes was unable to distinguish them.

The same changes of form observable in the Atlantic shells obtain in the Pacific. Sometimes it is very broad, with the ventral margin produced and flattened; sometimes orbicular, with all the edges well rounded. Sometimes (like its freshwater neighbour Cyclas cornea) it is considerably flattened, sometimes very much swollen. The umbos vary in the same manner; sometimes being but slightly prominent, sometimes very tumid and projecting, occasionally capped like Cyclas calyculata. The texture also is by no means constant; being sometimes hyaline and perfectly transparent, sometimes of a dull ashy colour, sometimes opaque white. One valve, agreeing in other respects, displays a large honeycomb pattern, the cells being transparent on an opaque ground. Most unexpectedly of all, differences are found in the hinge. The small cardinal teeth are sometimes distinct and conical, sometimes they pass off gradually into the laterals. These are sometimes long and slender, sometimes short, strong, slightly truncate. Sometimes the ligament pit is concealed; sometimes very conspicuous while the adjacent teeth are small. Often one or both of the cardinal teeth are absent (probably through accident,) and the laterals are scarcely perceptible; at other times they are unduly prominent. The aspect of the shell is generally slightly iridescent, either smooth or with extremely faint striæ of growth, with a very thin rather glossy epidermis. Almost all the Mazatlan specimens were found nestling (not boring) in family groups, in holes and crevices of the large Chamæ, Spondyli, &c.; the finest and most characteristic individuals lurking among mixed animal and vegetable debris, in the burrows of dead Lithophagi, Petricolæ, &c. Most of the specimens found were very young, but displayed their characters accurately under the inch or half-inch achromatics. They were frequently found in the small tubes of worms where they could never arrive at maturity. If specimens had been taken from the large hollows of dead bivalves, their favourite haunt in this country, they would probably have been stronger and larger. As the species is known to have existed from the

period of the Coralline Crag, it is natural to suppose that it has now a wide distribution, though its station is such as generally to elude discovery. It would be premature to pronounce absolutely on its specific relations, before the animals have been examined, and other seas more thoroughly searched. The extreme forms are quite sufficiently marked to allow of specific distinction; just as Capt. Brown has described 3 species from the British varieties; but the known propensities of nestling bivalves, and the presence of intermediate specimens with ever varying characters, do not justify this course. The smallest specimen is ·02 across: the largest measures *long.* ·24, *lat.* ·26, *alt.* ·15.

Hab.—British seas, *Auct.*—Mediterranean, *Philippi.*—Canaries, *M'Andrew.*—Mazatlan; not uncommon in crevices of shells, generally young; *L'pool & Havre Coll.*—[A species probably identical is from Peru; Col. Cuming.—The Chironia Laperousii of Desh., from Monterey, *Mr. Hartweg,* is quite distinct.]—Fossil: British Coralline Crag; *Searles Wood.*

Tablet 485 contains 12 pairs, of various sizes.—486, 10 pairs of valves, very young.—487, 10 do, adolescent.—488, 2 sp. which had lived inside a dead Sphænia fragilis, which had lodged in the hole of a Lithophagus aristatus, which had bored in Murex regius.—489, 4 sp. in situ, in Spondylus calcifer, Patella Mexicana, and Trivia sanguinea.

Tablet 490 contains 1 sp. much inflated.

Tablet 491 contains a pair of valves, with short truncated teeth: [P var.]—492, 2 pairs and a valve, orbicular.

Tablet 493 contains 3 valves, ligamental pit prominent: [P var.]

Tablet 494 contains the valve with the honeycomb pattern.

Genus LASEA, *Leach.*

Lasea, *Leach ms.*—*B. M. Cat. Br. Moll.* pt. vii. p. 81:—*Phil. Hand. Conch.* p. 345.—Lasæa, *Brown, Ill. Conch. Gr. Br.* 1827.—Lesæa, *Moll.* 1842 *Phil.* 1845.
Bornia sp., *Phil.* 1836.
Cycladina, *Cantraine,* 1836, *Bull. Ac. Sc. Brux.*
Poronia, *Récluz,* 1843, *Rev. Zool.* p. 166.
Kellia pars, *Forbes & Hanl. Br. Moll.* 1850, vol. ii. p. 85.
Autonoe, *Leach, (a secundâ manu.) Br. Moll.* 289.

154. LASEA ? RUBRA, *Mont.*

Cardium rubrum, *Mont. Test. Brit.* p. 83, pl. 27, f. 4. (non *Rve.*)
Tellina rubra, *Turt. Conch. Dict.* p. 168.
Kellia rubra, *Turt. Dith. Brit.* pp. 57, 258, pl. 11, f. 7, 8.—*Forbes & Hanl. Br. Moll.* vol. ii. p. 94, pl. 36, f. 5-7 : (animal) pl. O, f. 3.—*Clark Moll. Test. Mar. Br.* p. 92.—*Searles Wood Crag Moll.* pt. ii. p. 125, pl. 11, f. 10.
Poronia rubra, *Récl. Rev. Cuv. Zool.* 1843, p. 175.
Lasæa rubra, *Leach. ms.*—*Brown Ill. Conch.* 1827, t. 20, f. 17-19.
Lesæa rubra, *Brown, op. cit.* ed. 2, p. 93, pl. 36, f. 17, 18.
Petricola rubra, *Gray Ann. Phil.* 1825.
Lasea rubra, *B. M. Cat. Br. Moll.* vii. p. 82.—*Phil. Hand. Conch.* p. 345.
Bornia semilunum, *Phil. Moll. Sic.* vol. i. p. 14, pl. 1, f. 16, & vol. ii, p. 11.—*Krauss Sudafr. Moll.* p. 2.
Erycina violacea, *Scacchi, Cat.* 6.
Cycladina Adansonii, *Cantr. Bull. Acad. Brux.*
Cyclas australis, *Lam. An. s. Vert.* ed. *Desh.* vi. 270, (teste *Gray.*)
? Amphidesma nucleola, *Lam. op. cit.* vi. 270.
Autonoe rubra, *Leach, Br. Moll.* 288, pl. 12, f. 5, 7.
[For other references, v. *B. M. Cat.* loc. cit].

Whether the little Mazatlan shells (of which only one pair and a few valves were found,) are distinct from the typical Europæan species, must be left for future determination, when its distribution shall have been better ascertained. The teeth are smaller than in most British specimens, but it by no means differs from them so much as do the Mediterranean examples. The late, deeply regretted Prof. E. Forbes considered that they might be identical. He gives the species from the North and South Atlantic. Dunker quotes a similar shell from the Guinea coast, and Krauss the same from South Africa. I have it from Java, and Singapore (among Chamæ). Dr. Gould gives it from Massachusetts, South of Cape Cod. Mr. Cuming found a similar shell in abundance at Valparaiso, on high exposed rocks, seldom washed by the sea, along with a little Littorina, like L. neritea. An extremely similar species is K. miliaris, Desh. from Eagle Bay, Magellan. A species closely resembling it in shape but white, and with concentric ridges (which however, being irregular, may be a local variety) is from the Bay of Mexillones, Desert of Atacamas, Bolivia, adhering to Balani in exposed situations, *(Cuming)*. Lamarck's Cyclas australis is from the Isle of Timor, with a variety from K.

George's Port, N. Holland, *(Peron)*. From its station in crevices at extreme high water mark, it has probably often escaped detection. It may hereafter be found to be one of the very few ubiquitous species. The Mazatlan specimens were of normal shape, ·05 across.

Hab.—Britain, Mediterranean, &c.: v. supra.—? Mazatlan; extremely rare, from Chama and Spondylus; *L'pool Col.*

Tablet 495 contains the pair (broken in opening) and 2 opposite valves, probably belonging to each other.

155. LASEA TRIGONALIS, *n. s.*

L. t. plus minusve trigonali, complanatâ, concentrice striatâ, umbonibus acutis; cardine dentibus minimis; card. 1-2 *conicis, rotundatis; lat. longis, gracilibus, vix monstrantibus; fossâ ligamenti magnâ, marginem attingente; impress. musc. adduct. magnis, subrotundatis.*

Two specimens of this curious shell were found tightly wedged in the hole of a borer in a Spondylus valve. They are so different that they would be considered specifically distinct but for their position and general habit. One is very trigonal, Nucula-shaped, with a very projecting little conical tooth in one valve fitting between two very small ones in the other. The smaller specimen is of much more regular shape, with the teeth scarcely discernible. Both specimens are flat, concentrically striated, with a rough epidermis, and are rather pearly within. A minute pair and fragments were also found, the former measuring ·03 across.

The trigonal specimen measures *long.* ·28, *lat.* ·3, *alt.* ·17.
The smallest one „ „ ·19, „ ·24, „ ·11.

Hab.—Mazatlan; nestling in Spondylus, extremely rare; *L'pool Col.*

Tablet 496 contains the two large pairs and one small valve.

156. ? LASEA OBLONGA, *n. s.*

L. t. obovali, transversâ, inæquilaterali, tumidiore, antice productâ; albâ, epidermide cinereâ, horridiore, subpilosâ indutâ; umbonibus prominentibus; marginibus undique excurvis; dent. card. uno, minuto, conico, lat. gracillimis; fossâ ligamenti parvâ, appressâ.

Compare Chironia Laperousii, *Desh.* in *Woodw. Man. Moll.*, pt. 2. p. 295, pl. 19, f. 11.

One fine fresh valve was found of this species, which is not unlike Bornia luticola, *Val.* in *Rec. Obs. Humb.* The latter however appears to have very irregular ridges of growth and stronger teeth. The shell is distinguished by its transverse shape, rough, somewhat pilose epidermis, and minute teeth. It seems to partake of the characters of Lasea and Kellia. *Long.* ·16, *lat.* ·2, *alt.* ·1.

Hab.—Mazatlan; 1 valve off Chama; *L'pool Col.*

Tablet 497 contains the specimen.

Genus LEPTON, *Turt.*

Turton, Conch. Dyth. Brit., 1822, p. 61.—The typical species of this genus are easily distinguished by their flat, shagreened valves, and diverging, prominent teeth. They are ranked with Arcadæ by Clark, *Moll. Test. Mar. Brit.* p. 75 et seq. Dr. Gray constitutes for them a fresh family: while Philippi follows Forbes in locating them with Kelliadæ, and Woodward unites the whole tribe to the Lucinidæ. Much more must be learned of the animals of the foreign species before their true position can be ascertained. Some of the species can with difficulty be separated from Kellia by the shell alone.

157. Lepton Clementinum, *n. s.*

L. t. papyraceâ, albâ, concentrice undulatâ, punctulis minimis creberrimis confertâ; inæquilaterali, subquadratâ, umbonibus magnis, prominentibus; marginibus dorsalibus incurvatis; dent. card. uno, celato, fossam ligamenti parvam, depressam adjiciente; dent. lat. duobus curtis, divergentibus.

Although I had the misfortune to damage the only valve found of this beautiful species, yet the characters are so well marked that it appears best to describe it. The shell is shaped like Clementia, with a few stout, rather distant, concentric undulations: texture transparent, and exhibiting a most minute cellular structure, very evident by transmitted light. Hinge very small, with a tiny, sunken, ligament pit and a minute almost hidden cardinal tooth adjacent; and two very short but distinct diverging laterals. The umbo is made very prom-

ment by the hollowing out of the sides. *Long.* ·025, *lat.* ·035, *alt.* ·02.

Hab.—Mazatlan; 1 valve off Spondylus; *L'pool Col.*

Tablet 498 contains the specimen.

158. LEPTON DIONÆUM, *n. s.*

L. t. papyraceâ, albâ, subtrigonali; lævi, striulis incrementi minimis confertissimis: inæquilaterali, marginibus dorsalibus subrectis; cardine dent. lat. duobus curtis, prominentibus, fossam ligamenti haud parvam continentibus.

In the only valve found of this species, there is no cardinal tooth. The shape nearly resembles some species of Dione, with the dorsal margins nearly straight, and at right angles. It is known at once from L. Clementinum by the absence of cellular markings and concentric undulations, the place of the latter being supplied by minute crowded striæ of growth. *Long.* ·04, *lat.* ·06, *alt.* ·03.

Hab.—Mazatlan; 1 valve off Spondylus; *L'pool Col.*

Tablet 499 contains the specimen.

159. LEPTON UMBONATUM, *n. s.**

L. t. subquadratâ, subinflatâ, cinereâ, opacâ; striis incrementi, item huc et illuc liris acutis concentricis ornatâ; umbonibus parvis, valde prominentibus; margine ventrali compresso; cardine dent. lat. haud longis, excurvatis; fossâ ligamenti valde depressâ; impress. musc. subrotundatis.

Shell Kellia-shaped, but with a small extremely prominent umbo, and a flattened ventral edge. Surface of a dull ashy colour, with an extremely thin epidermis; rather solid, and not displaying the shagreened pattern; with the lateral teeth short, but not so much so as in the other species, somewhat

* As so little is known of this genus, I append a description of a perfect and well marked valve at present in my collection.

LEPTON PLACUNOIDEUM, *n. s.*—*L. t. planata, quadrata, subinæquilaterali, ventraliter incurva, papyracea, alba, haud punctata; liris concentricis acutis, ventraliter undulatis, interstitiis striis exillimis concentricis; umbonibus parvis, sed a linea dorsali recta valde prominentibus; fossa ligamenti parva; dent. lat. parvis, extantibus, divergentibus, in umbone sitis, ad marginem dorsalem paululum excurvatis; dent. card. altera in valva nullo, altera ?: imp. musc. haud conspicuis.*

Hab.—West Indies. Shaped like L. squamosum, but distinguished at once by the prominent umbos, incurved ventral margin, sharp concentric ridges, and absence of the shagreen pattern.—*Long.* ·07, *lat.* ·1, *alt.* ·03.

excurved; ligamental pit in the umbo. One minute valve, (·02 across,) and one ? adult were found. *Long.* ·06, *lat.* ·08, *alt.* ·04.

Hab.—Mazatlan; 2 valves off Spondylus; *L'pool Col.*

Tablet 500 contains the larger valve.

Genus PYTHINA, *Hinds.*

Voy. Sulph. 1844, p. 70.—Known by its very trigonal shape, often ventrally indented and divaricately sculptured. It must not be confounded with Pythia, *Schum.* 1817, = Scarabus, *Montf.*: nor with Pythia, *Gray*, 1821, = Conovulus myosotis, &c.

= Kellia, pars, *Phil. Handb. Conch.* p. 344:—*Woodw. Man. Moll.* ii. 295.

160. Pythina sublævis, *n. s.*

P. t. minimâ, albâ, epidermide tenuissimâ stramineâ indutâ; valde inæquilaterali, transversâ, trigonâ, umbonibus prominentibus, margine ventrali seu recto seu subincurvato; lævi, seu striulis exillimis divaricate radiantibus; dentibus card. alterâ valvâ ii. *divergentibus, quarum una major, alterâ nullis; dent. lat. elongatis, exillimis.*

Two pairs and two valves of this shell were found, differing in outline and sculpture, but probably identical. The character of the hinge seems more related to Montacuta than to Kellia. The smallest valve is ·025 across: the largest measures *long.* ·05, *lat.* ·08, *alt.* ·025.

Hab.—Mazatlan; on Chama and Spondylus, extremely rare; *L'pool Col.*

Tablet 501 contains the two pairs, one closed, the other opened.

Genus MONTACUTA, *Turt.*

Conch. Dithyr. Brit. p. 58, 1822.

According to *Clark, Moll. Test. Mar. Br.* pp. 88, 94, the typical species of this genus belong to the Anatinidæ, while the aberrant species remains to constitute a new family. Of

the following species, only a few valves have been found. They are however described provisionally, as so little is known of the tribe.

161. MONTACUTA ELLIPTICA, *n. s.*

M. t. obovali, planiusculâ, albâ, marginibus undique satis excurvatis; concentrice tenuissime striatâ; umbonibus prominentibus; valvâ alterâ, fossâ ligamentum recipiente, dent. card. nullo, lateralibus longis, gracilibus, ad marginem adhærentibus; valvâ alterâ....?

Only 2 valves (not opposite) and one minute pair which I have not dared to open, were found of this species. The shape is very regular, and the teeth very slender. The pair is less inæquilateral, but this is probably due to its youth, being only ·03 across. *Long.* ·1, *lat.* ·13, *alt.* ·04.

Hab.—Mazatlan; off Chama and Spondylus, extremely rare; *L'pool Col.*

Tablet 502 contains the pair and largest valve.

162. ? MONTACUTA SUBQUADRATA, *n. s.*

M. t. oblongâ, subquadratâ, solidiore, flavescente seu cinereâ; sulcis concentricis, creberrimis, rotundatis; umbonibus appressis, lunulâ excavatâ; valvâ alterâ dent. card. uno, inter fossas duas, dent. lat. longis, prominentibus; valvâ alterâ dent. card. uno, elongato, prope marginem, fossâ unâ, latâ; dent. lat. subobsoletis.

One perfect and two broken valves were found, which are probably conspecific. The genus is doubtful: the hinge in one valve resembles Gouldia, and the shell is too much worn to determine the position of the ligament. It appears as though there were two cardinal teeth interlocking, with the ligament occupying the second pit: but instead of the hinge area being interrupted, the pits are on a raised plate, as in Mactra, &c. Outside it resembles in miniature some of the oval Oolitic Astartidæ. *Long.* ·1, *lat.* ·13, *alt.* ·03.

Hab.—Mazatlan; off Chamæ, extremely rare; *L'pool Col.*

Tablet 503 contains the large perfect valve, with the fragment that is supposed the opposite.

162. MONTACUTA ———, *sp. ind.*

Tablet 504 contains a fragment of a stout shell, in many respects like ? M. subquadrata; but entirely destitute of cardinal teeth. The lunule is much incurved: indistinct ridges run from the prominent umbo to the anterior and posterior margins; surface concentrically striated; hinge margin interrupted, with large sunken cartilage pit bounded by 2 marginal callosities, but no lateral teeth. The shell when perfect was probably larger than the last.

Hab.—Mazatlan; off Chama; *L'pool Col.*

FAMILY CYCLADIDÆ.

GENUS CYRENA, *Lam.*

164. CYRENA OLIVACEA, *n. s.*

C. t. compressâ, subtrigonâ, lævi, vel striis incrementi haud impressis, epidermide olivaceâ indutâ; margine ventrali excurvato, posticum versus plerumque sinuato; postico angulato, subrostrato; latere dorsali antico declivo, vix alato; umbonibus satis prominentibus, ligamento elongato; epidermide umbones tegente, lamellis parvis corrugatis plerumque indutâ, maxime angulam posticam versus; intus purpureâ, maxime umbones et marginem versus; dent. card. iii., *quarum alterâ valvâ antici duo, alterâ postici duo, bifidi sunt; lat.* 2-2, 1-1, *parvis, lævibus, extantibus, quarum antici propinqui, postici remoti sunt; sinu pallii parvo, triangulari, angustissimo.*

= C. Fontainei, *Desh.* ms. in B. M. et Mus Cuming, et *P. P. C.* in *Cat. Prov.*: non *D'Orb.*, ad fid. spec. typ.: nec *Phil.* in *Zeit. f. Mal.* 1851, p. 70, no. 93.

This shell has been freely distributed as C. Fontainei, *D'Orb.*, on the authority of M. Deshayes, who having the original types to consult, was supposed to be correct. The true C. Fontainei, however, is a more regularly formed shell, with faint concentric ribs and a glossy epidermis, and appears identical with C. placens, Hanl. 1844. The species which Philippi has described under the same name is distinct from either: it may prove to be the following. C. olivacea is known outwardly by its flattened form, generally beaked posteriorly;

and by the rich olive epidermis, covering the umbos, and rising into irregularly corrugated folds, which are very close on the posterior part. The interior displays a very dark purple over the greater part of the surface. Anterior adductor very near the margin. The outline varies considerably, but not so much as in the next species.

The largest specimen measures *long.* 2·2, *lat.* 2·38, *alt.* 1·26.
A transverse „ „ „ 1·7, „ 2·05, „ 1·06.
An inflated „ „ „ 1·62, „ 1·8, „ 1·16.
Hab.—Mazatlan; not common; *L'pool Col.*

Tablet 505 contains 3 specimens much produced ventrally, slightly so posteriorly.—506, 3 do. less produced.—507, 3 do. very slightly produced, normal shape.—508, 2 do. margin regular, very transverse.—509, 2 do. less transverse.—510, 3 do. very irregular outline.—511, 1 do. orbicular, aberrant, approaching aberrant forms of the next species.

165. CYRENA MEXICANA, *Brod. and Sow.*

C. t. "*C. olivaceæ*" *simulante, sed ventricosiori, formâ maxime variante, suborbiculari, subtrigonâ, seu ellipticâ; parte posticâ seu prolongatâ, seu subcarinatâ, seu rotundatâ; extus albescente, umbonibus plerumque maxime erosis; epidermide fusco-olivaceâ, lamellis creberrimis, non corrugatis, plerumque detritis; intus albâ, marginibus plus minusve violaceâ; dent.. card. magis inæqualibus, lat. magis extantibus; sinu pallii minimo, marginibus paulum divergentibus.*

Cyrena varians, *P. P. C. Cat. prov.*
Pars=Cyrena Mexicana, *Zool. Journ.* vol. iv. p. 364.—*Hanl. Descr. Cat.* p. 94.—*B. M. Cat. Corbiculadæ*, p. 260, no. 59.
Var.=Cyrena altilis, *Gould, Mex. & Cal. Shells*, p. 27, pl. 16, f. 5.
Jun.=Cyrena fragilis, *Desh.* ms. in Mus. Cuming.
?=C. Floridana, *Conr. Proc. Ac. N. S. Phil.* iii. 1846, p. 23, pl. 1, f. 1.—*B. M. Cat. Corb.* p. 257, no. 49.

The original type of this species "in Mr. Sowerby's collection" appears to be lost, and the description is too meagre to separate it from its congeners: "*C. t. ellipticâ, ventricosâ, utrinque rotundatâ, antice breviore; dentibus parvis, obtusis.*" Nevertheless, as it is further stated to be "outside white, with an olivaceous epidermis; inside whitish, varied with reddish violet;" and as it came from Mazatlan, it is fair to conclude

that it is the same shell. In order, however, to include the whole of the species, a new description is appended, which I had drawn out under the name, C. varians, which is certainly not inappropriate. A very extreme form, also found by Mr. Darbishire in the L'pool Col., has been named C. altilis by Dr. Gould, from specimens, one of which is marked "Mexico" by *Maj. Rich;* another "? Mazatlan" by *Col. Jewett.* Some of the young shells are ticketed C. fragilis in the Cumingian Collection; but as the name does not appear either in the *P. Z. S.* nor in the *Cat. Corb.* it has probably been merged into another, perhaps C. Floridana.

Although the general appearance of these shells is sufficiently distinct from C. olivacea, yet there are many points of resemblance between individuals. This species however, is much more variable; almost always more ventricose; epidermis thinner, more deciduous, of a dirty brownish olive, with the layers very close and thin, not corrugated. These layers are generally abraded, as are the umbos. The anterior cardinal teeth are rather more elongated: the lateral teeth rather more elevated; the pallial sinus is rather triangular, not so narrow as it generally is in C. olivacea. The violet colour is also of a somewhat lilac tinge, and very rarely covers the whole shell. While the outside is anything but attractive, the inside is often extremely rich and beautiful. The young shells (of which an abundance were sent, but very few of C. olivacea, jun.) vary quite as much as the adults. Of the most aberrant, suborbicular form, Mr. Darbishire possesses a fine swollen specimen, with the umbos not abraded, and greatly resembling (except in the epidermis and the inequality of the teeth,) the specimen, tablet 511, of the last species. A young suborbicular specimen measures *long.* ·95, *lat.* 1·06, *alt.* ·76.

A young transverse sp.	„ 1·13,	„ 1·5,	„ ·81.
The largest sp.	„ 2·15,	„ 2·52,	„ 1·46.
Mr. Darbishire's sp.	„ 1·67,	„ 1·74,	„ 1·19.

Hab.—Mazatlan; not common; *L'pool Col.*

Tablet 512 contains 4 specimens, very regular outline, suborbicular.—513, 4 do. slightly transverse.—514, 4 do. a little more transverse.—515, 5 do. very transverse.—516, 4 do., the same, slightly swollen ventrally.—517, 4 do. rather more swollen.—518, 5 do. less transverse, normal state.—519, 4 do. margin regular.—520, 5 do. subtrigonal.—521, 4 do. posterior part subangulated.—522, 6 specimens shewing the interior.

Family UNIONIDÆ.

Genus ANODONTA, *Cuv.*

Anodonta, *Cuv. Tabl. Elém.* 1798.—Anodon, *Oken*, 1815.

166. Anodonta ciconia, *Gould.*

Anodon ciconia, *Gould Proc. Bost. Soc. Nat. Hist.* vol. iv. p. 92, Nov. 1851:—*Mex. & Cal. Shells*, p. 29.
Anodon sinuata, *Swains.* (as of *Lam.* non A. sinuosa, *An. s. Vert.* vol. vi., p. 569, no. 14.) *Exot. Conch.* p. 29, pl. 16, edit. *Hanl.*

Distinguished from A. anserina, (Brazil,) according to Gould, by being thicker, more tumid on the posterior half, epidermis and nacre differently coloured. The nearest N. American species is A. implicata. It varies in shape, but may generally be known by its somewhat solid growth, ventral gape, and salmon colour within. In the young shell, the tint is silvery, light or flesh colour. *Long.* 2·32, *lat.* 4·24, *alt.* 1·46.

Hab.—? Mexico, *Lieut. Green.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 523 contains 3 sp. elongated form.—524, 2 sp. intermediate.—525, 2 sp. produced ventrally, epidermis glossy with faint radiating lines of colour.—526, 1 sp. with concentric striæ near the umbos.—527, 2 sp. distorted.

Family MYTILIDÆ.

Dr. Dunker is at the present time engaged on a monograph of this family, of which the first part only (Monograph of the genera Septifer and Dreissena) is as yet published. He has however most kindly identified the Mazatlan species with his own, and given me much valuable information concerning them. The young shells not only of different species, but even of different genera, very closely approximate each other.

The measurements in this family are taken as follows; *long.* from umbo to posterior extremity; *lat.* from dorsal extremity of ligament straight across to ventral margin; *alt.* thickness of closed valves.

Genus MYTILUS, *Linn.*

167. Mytilus palliopunctatus, *Dkr.*

M. t. subrectâ, elongatâ, angustâ, tumidiore, solidâ, plerumque varie detritâ; rugis incrementi concentricis sæpe instructâ; epidermide crassâ, corneâ, fusco-olivaceâ, horridiore, radiatim tenuissime aratâ, plus minusve indutâ; margine dorsali et cardinali parum excurvato; ligamentô solido, extus umbones spiraliter ascendente; paginâ internâ pulcherrime atro-purpureâ, splendente, aperturam byssalem versus pallidâ, punctis sparsim valde impressis; cicatricibus muscularibus conspicuis, plerumque maxime corrugatis.

M. tenuiaratus, *Dkr.* ms., a prima manu.

Shell long, swollen, rather straight, pointed, almost always rubbed at various angles, but when perfect exhibiting very fine radiating striulæ, and sometimes much stronger concentric lines of growth. Interior of a lustrous dark purple, white near the byssus, punctured over the principal part of the surface, as in many species of Semele. In the only adult specimen observed displaying the umbos distinctly, the ligament is seen to wind towards them outside the shell, presenting an appearance as in some Myoconchæ. The muscular impressions are strongly marked, and often very rugose. The very young shells display neither striulæ nor punctures, and are scarcely to be distinguished from the smooth variety of the next species. *Long.* 3·5, *lat.* 1·38, *alt.* 1·3.

Hab.—Mazatlan; abundant, but always rubbed; *L'pool & Havre. Coll.*—S. W. Mexico, *P. P. C.*

Tablet 528 contains 7 sp., very young, the smallest ·04 across.—529, a sp. with numerous young outside, in situ.—530, 8 pairs and a valve of successive ages, normal form.—531, 5 do. elongated.—532, 5 do. very narrow, elongated.—533, 5 sp. curiously rubbed.—534, 1 do. with one beak ·26 shorter than the other.—535, 1 do. persecuted by Lithophagi about the hinge.—536, 3 do. distorted growth.—537, 2 do. mantle cleft.—538, 4 sp. jun. shewing interior.—539, 4 do. adult.

168. Mytilus multiformis, *n. s.*

M. t. parvâ, maxime variante, sed plerumque angustâ, prope cardinem tumidâ, angulo perobscuro diagonali; margine

dorsali, prope cardinem perangulato, interne semper plus minusve crenato; margine ventrali planato seu incurvo; superficie modo liratâ, liris plus minusve divaricantibus, modo striatâ, seu omnino lævi; colore purpureo, ad marginem ventralem viridi: ligamento curto, lato, effosso.

Variat t. omnino viridi, planata, liris tenuibus.

"Crenarum indoles Modiolam sulcatam, *Lam.* aliasque species in mentem vocat; statura similis est M. Lavalleano, *D'Orb.* (et M. Senegalensi=variabili, *Krauss*) sed satis ab eo differt," *Dkr.* M. glomeratus, *Gould*, (San Francisco) is about the size of this species, but more resembles M. edulis in form, and has no crenations.

This extremely changeable little shell might furnish materials for many species, if only a few picked specimens were examined; but between the perfectly smooth and the deeply sulcated, the swollen and the flattened forms, there exists so regular a gradation that it is impossible to separate them. The young shell is shaped like Modiola. The smooth specimens closely resemble the young of M. palliopunctatus, but maybe distinguished by the presence of at least two or three denticles at the angle of the hinge line, and generally by a few more at the umbos. These may often be seen in the closed shell by transmitted light. Frequently the entire hinge line, as well as the posterior margin, is crenated. The majority of young specimens are smooth, and of adults sulcated; but often very minute specimens are plicated while those of (for the species) large size are smooth. The colour is generally purple, with a larger or smaller greenish portion near the byssus; but sometimes the purple is curtailed to a small patch, or is absent altogether. The shell is then generally flat, with fine, branching furrows: and might fairly be taken for a different and well-marked species, but for intermediate forms. The smallest specimen found measured scarcely ·02 across; an unusually large one, *long.* ·45, *lat.* ·24, *alt.* ·32.

Some forms of the green variety might easily be taken for another species. Nevertheless they go through the same changes from nearly smooth to coarsely plicate, and often display purple at the commencement, or have purple at the margin. Occasionally a smooth purple shell suddenly changes to a plicate green one. The green shells are generally flatter, and often have the ribs somewhat nodulous; in which state they are known from the young of Septifer Cumingianus by the absence of hairs on the epidermis.

Hab.—Mazatlan; jun. abundant, rare adult, among sea weeds on Chamæ, Spondyli, Ostreæ, Patellæ, &c., or in the cavities of dead Lithophagi or Balani; *L'pool & Havre Coll.*

Tablet 540 contains 5 pairs and 6 pairs of valves, smooth form.—541, 7 pairs and 6 pairs of valves, slightly lirate.—542, 11 pairs and 7 pairs of valves, lirate, jun.—543, 7 pairs do. adult.—544, 2 pairs and a valve strongly lirate.—545, 2 sp. in crevices of Balanus and Lithophagus; another Balanus has a crab in situ; off Patella Mexicana.—546, a group in situ among Balani, on M. palliopunctatus.—547, 2 sp. one with the surface in concentric layers, like Crepidula Lessonii; the other with young Nullipore.

Tablet 548 contains 5 pairs and 4 pairs of valves, greenish var., smooth form.—549, 7 pairs and 4 pairs of valves, finely lirate.—550, 4 pairs and 1 pair of valves, strongly lirate.—551, 1 large valve, flat and broad.

Tablet 552 contains 3 pairs and 2 valves, probably belonging to this species.

Genus SEPTIFER, *Récl.*

Vide *Dunk. Com. Sep. et Dreis.*, Marburgh, 1855.—Tichogonia, pars, *Rossmassler*, 1835.

169. Septifer Cumingii, *Récl.*

Dunker, Monog. Sept. p. 8, no. 18.

The few specimens found are too young to identify with accuracy. They are covered with fine, granulose ribs, with rather long bristly hairs rising up between. The umbonal plate is scarcely perceptible in the smallest shells. Hinge line crenate, as in M. multiformis. They closely resemble the young of S. biloculâris, but geographically agree better with the species quoted. The largest specimen measures only ·16 in length.

Hab.—Panama, Mus. Cuming.—Mazatlan; extremely rare, jun. on Spondylus; *L'pool Col.*

Tablet 553 contains 3 pairs of different ages.

Genus MODIOLA, *Lam.*

Volsella, *Scopoli*, 1777.—Modiola, *Lam.* 1801.—Modiolus, *Risso*, 1826.

170. MODIOLA CAPAX, *Conr.*

Journ. Ac. Nat. Sc. Phil. vol. vii. p. 242.—*Hanl. Descr. Cat.* p. 236.

Modiola spinifera, *P. P. C., Cat. Prov.*

??Jun.—Mytilus spatula, *Mke.* in *Zeit. f. Mal.* 1848, p. 2.

This species having been examined at every stage, from ·03 to 6·5 in length, it is possible to give a tolerable account of its history. It begins life as a small white body, shaped like Anodonta, but with the umbos very prominent and subcentral. The anterior part is then very large, the posterior very short in proportion. It soon however assumes the normal form, from which (in about 60 specimens examined) it varies but little. This differs from M. modiolus, in being slightly winged and strongly angled (about 130°) at the dorsal margin, and in being very much produced posteriorly. The epidermis when young is light green and smooth; soon it changes to a dark chesnut colour, generally developing concentric rugose irregular lines, and an abundance of hairs. These, in the very young shell are long, and not serrated; but soon they become shorter in proportion, very strong and hard, and armed on one side with sharp, rather distant serrations. The cuticle is thin, smooth and glossy on the ventral part, and inside the margin. Colour at first white, tinged with purple; afterwards very iridescent and shaded with flesh colour and puce, with yellow near the ventral margin. Ligamental pit deeply sunken, slightly bent, bounded by a strong ridge. None of the Mazatlan specimens were remarkable for size; a valve however from La Paz in Dr. Gould's collection measures, *long.* 6·5, *lat.* 3·, *alt.* 2·5.

Hab.—San Diego; in marshes and muddy shores; *Nuttall*—San Diego, *Lieut. Green.*—La Paz, *Col. Jewett.*—Gallapagos, *Cuming.*—S. America, [?] *Kellatt*, in B. M.—S. W. Mexico, *P. P. C.*—Mazatlan; rare, spinning a copious byssus, often attached to gravel or to each other, harbouring Marginella, Cœcum, Eulima, Odostomia, &c.; *L'pool Col.*

Tablet 554 contains 10 pairs and a minute valve, various ages.—555, 2 sp. adolescent.—556, 1 do. adult.—557, specimens of the thorny hairs.

171. MODIOLA BRASILIENSIS, *Chemn.*

Mytilus modiolus Brasiliensis, *Chemn. Conch. Cab.* vol. xi. pl. 205, f. 2020-1.

Jan. 1856. *m*

Modiola Brasiliensis, *Hanl. Descr. Cat.* p. 234.—*Dkr.* in lit.
Mytilus bicolor, *Brug. Cat.*
Modiola Guyanensis, *Lam. An. s. Vert.* vol. vii. p. 20, no. 4.—*Deles. Rec.* t. 13, f. 9.
Mytilus Guyanensis, *Desh. Enc. Méth.* vers. vol. ii. p. 565, no. 24.
=Modiola semifusca, *Sow.* (non *Lam.*) *Gen.* f. 6.—*Rve. Conch. Syst.* pl. 101, f. 6.—*C. B. Ad. Pan. Shells*, p. 251, no. 399.

The typical form is remarkably constant in its characters, while the ? var. is very changeable. Shell extremely thin, very rhombic, with the ventral and dorsal lines very straight, at an angle of about 30°, a well marked diagonal ridge, and a somewhat straight posterior line, at a mean divergence of about 105° from the dorsal line: with concentric furrows on the posterior part of the shell. This is coloured olive green; while the anterior ventral part is smooth, and of an orange colour, with a narrow diagonal band of light orange, separating the two areas. Inside stained dorsally with reddish purple. Umbos not decorticated. *Long.* 3·3, *lat.* 1·5, *alt.* 1·1.

Hab.—Brazils, Guyanæ, *Dunker.*—Venezuela, (Porto Cabello et Caraccas,) Bay of Guayaquil; *Dr. Tams*, teste Dunker.—Mazatlan; rare; *L'pool & Havre Coll.*—Panama, rare, *C. B. Adams.*

Tablet 558 contains 2 specimens, young and old.

171 *b*. MODIOLA ?BRASILIENSIS, *var.* MUTABILIS.

Modiola semifusca, *P. P. C., Cat. Prov.*; non *Sow.*; nec *Lam. An. s. Vert.* vol. vii, p. 22, no. 11, (teste *Hanl.*)

M. ? Brasiliensis, t. solidiore, epidermide atro-fuscâ indutâ, apicibus plerumque decorticatis; staturâ minore: formâ maxime variante; margine ventrali recto seu valde incurvato; plus minusve elongatâ; angulo diagonali indistinctiore; margine posteriore plus minusve excurvato.

This shell suits exactly the description of Lam., but is distinct from the shell which Mr. Hanley states to be the true M. semifusca. According to Hanley, Dunker, and the first impressions I received from an examination of the specimens, this may be a rough water var. of M. Brasiliensis: there is however sufficient doubt to make it desirable that the variations from other recorded localities should be accurately

investigated. The N. Zealand specimens appear intermediate between this and the typical form, differing from the latter in being a flatter shell, with a well rounded posterior margin. This shell appears to take all allowable forms except the typical one, the margins never being so straight and angular, and the diagonal keel being less impressed. The muscular impressions vary somewhat, the posterior adductor being generally retort-shaped. The young shells display a fine olive spotting on a light ground in the posterior part, which is always much produced. The largest specimen (distorted) measures *long.* 2·5, *lat.* 1·2. *alt.* 1·1.

Hab.—Mazatlan; not common; *L'pool & Havre Coll.*—? New Zealand, *Hincks.*

Tablet 559 contains 1 adolescent specimen, oval form.—560, 2 sp. broad, dorsal margin straight.—561, 2 do. very long.—562, 2 sp. slightly curved.—563, 2 do. ventral margin much incurved.—564, 1 large specimen, somewhat distorted.

Tablet 565 contains a valve ·05 long, of a oval form, with the concentric furrows clearly marked.

Genus CRENELLA, *Brown.*

Crenella, *Brown*, 1827.—Lanistes, *Swains.* 1840, (non *Montf.*)—Lanistina, *Gray*, 1847.—Myoparo, *Lea*, 1833.—Modiola, sp. *Lam.*

172. Crenella coarctata, *Dkr.*

Dunker in lit.—No. 185, 190, Mus. Cuming.

Comp. Modiola Chenuanus, *Récl.* = Mytilus C., *B. M. Cat. D'Orb. Moll.* p. 84, 754.

Comp. M. opifex, *Say.*

Shell very variable in shape, but generally very tumid, with a medial constricting line, between which and the anterior part it is nearly smooth: the rest with rather fine radiating striæ, divaricating on the diagonal angle, which in adult shells is clothed with a very coarse bristly epidermis. The striæ on the dorsal part, which is much hollowed by the protuberance of the umbos and the diagonal angle, are somewhat decussated. It appears to have the power of burrowing, like Lithophagus, a specimen having been so found in the umbilical portion of

Murex princeps. The youngest specimen measures ·05 in length. A large specimen in Dr. Gould's collection, (locality not recorded) measures (without taking into account the epidermis) ● ,, *long.* ·62, *lat.* ·28, *alt.* ·25.
A long, narrow sp. ,, ·15, ,, ·06, ,, ·06.
A short, transverse sp. ,, ·18, ,, ·14, ,, ·12.

Hab.—Gallapagos, *Cuming.*—Mazatlan; in Spondylus calcifer, and burrowing in Murex regius, very rare; *L'pool & Havre Coll.*

Tablet 566 contains 3 sp. very young.—567, 3 do. adolescent and adult, of which one displays concentric ridges of growth, like Crepidula Lessonii.

Genus LITHOPHAGUS, *Megerle.*

Lithophagus, *Megerle von Mühlf.* 1811, *Entw.* p. 69:—*Phil. Handb. Conch.* p. 363:—*Dkr. Com. Sept. et Dreis.* p. 2.—Lithodomus, *Cuv.* 1817, *Regne Anim.* vol. iii. p. 136.—Modiola, sp. *Lam.*

173. Lithophagus attenuatus, *Desh.*

Modiola attenuata, *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 28, no. 25. *Hanl. Descr. Cat.* p. 238.
Lithodomus caudigerus, var., *Sow. Gen.* f. 3.—*Rve.* pl. 99, f. 3.

Known by its greatly produced, slender form, and by the incrusting beaks, which are appressed, smooth, closed externally, but hollowed in the whole inner surface. Master Archer found a very large specimen, measuring *long.* 4·7, *lat.* 1·4, *alt.* ·96.

Hab.—Peru, Chili, in stones, Deshayes.—Mazatlan; extremely rare, burrowing in Spondylus calcifer, Imperator olivaceus, and Murex princeps; *L'pool & Havre Coll.*

Tablet 568 contains a sp. of Imperator olivaceus, broken across, and displaying a young L. attenuatus, with L. aristatus.—569, a very young sp. ·13 in length.—570, a drawing of Mr. Archer's specimen, by Master John Jackson.

174. Lithophagus calyculatus, *n. s.*

L. t. tumidiore, curtâ, in dorso valde angulatâ; umbonibus appressis, inconspicuis; parte anticâ tumidâ; margine

ventrali incurvo; epidermide fuscâ, rugis concentricis parte posteriore instructâ; incrustatione in parte posticâ solidâ, in lineas duas ab umbonibus decurrente, striis sagittiformibus inconspicuis ad marginem directis; in rostrâ solida prolongatâ, appressa, maximâ parte non excavata sed ad apicem alte effossa, quasi calycem adhibentia.

The only specimen found is in shape like L. arist. tumidior, but differs in the remarkable character of the incrustation. This lies in a solid triangular layer over the posterior part, with arrow-headed lines pointing away from the vertex of the triangle. At the sides, the coarse rugæ of the epidermis are visible, ending in a diagonal line bounding the posterior part. The incrusting beaks are appressed, as in L. attenuatus, but are not hollowed within, as in that species, until the extremity, where there suddenly appears a deep cup, dividing the termination into two knobs. This might at first appear as if bored into by another mollusk, but (1) the excavation is not sideways but from the outer end; (2) the remains of the animal are fresh within; (3) the lines of growth on the incrustation display a similar outline. *Long.* ·36, *lat.* ·14, *alt.* ·15.

Hab.—Mazatlan; 1 sp. in Spondylus calcifer; *L'pool Col.*

Tablet 571 contains the specimen.

175. LITHOPHAGUS PLUMULA, *Hanl.*

Proc. Zool. Soc. 1844, p. 17.

Modiola plumula, *Hanl. Descr. Cat.* p. 239.

Comp. L. lævigatus, *B. M.* non *Quoy & Gaim.* (Cape Upstart, *Jukes.)*

Comp. L. rugiferus, *Dkr.* in lit. Mazatlan (teste Cuming): "differt a L. plumula forma et incrustationis indole diversa. Margines cardinalis et basalis haud paralleli, pars anterior minus inflata est. Latus basale rugis instructum est." *Dunker.* Spec. unic. in Mus. Cum. no. 172.

The species is known by the remarkable character of the incrustation, which for the most part presents the arrangement of a feather in lines running out on each side from a midrib which joins the umbo to the posterior end. The incrustations form beaks beyond the shell, appressed but not prolonged or hollowed within. Its texture is sometimes tolerably solid, sometimes in a branching network. It does not present an organized structure under the microscope, nor

is the pattern constant, though there is a general adherence to a particular plan. It often presents the appearance of grains of detritus cemented together by animal matter, these grains also covering the body of the shell much more coarsely than in L. aristatus. It is thus that the young shells can generally be separated; the epidermal tubercles being much larger, and the concentric wrinkles stronger. The number of specimens however was not large enough to ascertain these points with precision. The differences in the pattern of incrustation do not accompany those in form. The shape presents the same two extreme varieties, gracilior and tumidior, as in L. aristatus. The parallelism of the margins also is not constant. The burrows are in most respects like those of L. aristatus, *q. v.* They are shaped like the shell, and allow very little space for the opening of the valves. The orifice is almost close to the exterior, and is not bilobed. The largest perfect specimen measures *long.* 1·86, *lat.* ·53, *alt.* ·5. A very tumid sp. in Mr. Darbishire's Col. measures *long.* 1·9, *lat.* ·9, *alt.* ·6.

Hab.—Panama, in Spondyli, *Cuming.*—Philippines [?], Hanley.—Mazatlan; rare in Spondyli, very rare in Chamæ and Patella Mexicana; *L'pool & Havre Col.*

Tablet 572 contains 6 pairs young, the smallest ·08 in length.—573, 4 sp. adolescent and adult, typical form.—574, a sp. in situ, burrowing in the attached part of the Spondylus calcifer: portions of the rock remain, which appear to have been bored by Pholads; a burrow is seen of P. calva.—575, 2 fragments shewing the extremities of the burrows which are more nearly round than in L. aristatus.—576, fragments illustrating shell structure.—577, do. incrustations.

Tablet 578 contains 3 sp. different ages, var. *gracilior.*

Tablet 579 contains 1 pair and 2 valves do., var. *tumidior.*

Tablet 580 contains a sp. with the anterior part less swollen, and the lines not parallel.

176. Lithophagus aristatus, *Sol.*

Mytilus aristatus, *Dillw. Descr. Cat.* 1817, vol. i. p. 303, no. 8.—*Solander, ms..—Wood, Ind. Test.* pl. 12, f. 8.

Lithodomus aristatus, *Forbes & Hanl. Br. Moll.* vol. ii. p. 212. *Enc. Méth.* Vers, pl. 221, f. 8, *a*, *b*.

Le Ropan, *Adans. Sen.* p. 267, pl. 19, f. 2.

Mytilus lithophagus striatus, *J. Sow. Linn. Trans.* 1804, vol. viii. p. 274, pl. 6, f. 2, 3-5.

Modiola caudigera, *Lam.* 1819, *An. s. Vert.* vol. vi. p. 27, no. 23.—*Hanl. Rec. Shells*, p. 238.—*Phil. Abbild. Conch.* vol. ii. p. 149, pl. 1, f. 5.

Mytilus Ropan, *Desh.* in *Lam.* loc. cit. (note.)

Lithodomus caudigerus, *Sow. Gen.* f. 4.—*Rve. Conch. Syst.* pl. 99, f. 4.

Lithodomus lithophagus, *Flem. Br. An.* p. 414.—*Br. Mar. Conch.* p. 111: (non *auct.*)

The Mazatlan specimens vary greatly among themselves, being sometimes nearly as narrow as L. attenuatus, at other times approaching in form L. cinnamomeus; yet they offer no marks by which they can be separated from the long known W. African species. It begins life, (as may be seen on tracing the lines of growth in the youngest specimen ·035 long,) shaped like Unio margaritacea, but more swollen. Soon however the anterior portion is shortened proportionally, while the posterior part is prolonged. The umbos from the earliest period are quite flat, and are soon covered by a slight reflexion over them from the anterior margin. The shell is extremely thin, and covered with a glossy chesnut epidermis, turned in over the margin. Soon tubercles appear in regular rows on the epidermis, which seem to furnish the foundation for the accretion which presently commences. This accretion appears under the microscope as if formed by the agglomeration of particles of the shell into which the creature has bored. It soon covers, more or less, the whole of the epidermis, and is deposited in a thick coating at the posterior end. Here, beginning to appear generally when the shell is about ·12 long in the form of small terminal knobs, it gradually develops into two shelly spikes, which twist more or less round each other, and are somewhat but never wholly opposite at their bases. These spikes vary greatly in size and shape, sometimes attaining nearly half the length of the shell. They may generally be seen peeping out from the orifice, which is somewhat bilobed, though not so distinctly as in Gastrochæna. When the matrix in which they burrow is not sufficiently solid, they line that part with shelly matter, which occasionally projects as a separate case, as in the British Gastrochænæ. This lining is generally found where one burrow crosses another; it was not however universal when crossing the empty part of Imperator. In this shell the creature generally has the instinct to burrow through the thick sutural portion, or else down the axis. In old specimens, the burrow is often lined with a grayish deposit, apparently

intermediate in texture between the shell and the calcareous incrustation. This deposit extends about half way down the burrow. This species and L. plumula are always found close to the outside of the matrix; but they do not affect the same situations. In Patella Mexicana, L. aristatus is often very common. In about one fifth of an aged limpet Mr. Darbishire found 13 large specimens, without reckoning empty burrows. Here however, and in Chama, L. plumula is extremely rare; while in the thick lower valves of Spondylus it is not uncommon. The burrows are shaped nearly as the shell, with no power of rotatory motion, and very little scope for opening the valves. Traces of the foot mark are very rare. The shell, when adult, is more or less incurved ventrally, and angled dorsally; tumid at both extremities. Shell (without epidermis and incrustation) extremely thin. The largest specimen found perfect measures *long.* (with the beaks) 1·56, *lat.* ·47, *alt.* ·4.

Hab.—Senegal and West Indies; found in ballast, London roads (!), *Forbes.*—Senegal, in shells of Balani, *Adanson.*—Abundant in Ostrea iridescens, W. coast Africa, *Stutchbury*: —do. do. Anamaboa, B. M.—Guinea, *Tams.*—Red Sea, *Dunker.*—St. Thomas, *Hornbeck.*—Mazatlan; abundant in Chamæ, Spondyli, Ostrea iridescens, Patella Mexicana and discors, Imperator unguis and olivaceus, Strombus galea, &c; *L'pool & Havre Coll.*

Tablet 581 contains 11 pairs, and 8 pairs of valves, extremely young.—582, 5 pairs and 4 pairs of valves, a stage older.—583, 8 pairs and 3 pairs of valves, do.—584, 6 sp. adolescent.—585, 5 do. adult.

Tablet 586 contains 6 young sp. in situ, burrowing in Patella Mexicana.—587, 1 do. do. with the beaks detached, shewing the glossy epidermis beneath.—588, 2 adult sp. in P. Mexicana.—589, fragment of P. Mexicana, displaying shelly lining to tubes.—590, another fragment, in which a Lithophagus had bored ·6 beyond the inner surface; the limpet having defended itself from its pursuer by fresh layers of shell.—591, 4 sp. of Patella discors, variously distorted by Lithophagi.—592, Fissurella rugosa and F. alba, similarly attached.—593, Mytilus tenuiaratus, with 3 Lith. in situ: part of the mussel being broken away displays its jasper-like texture, as well as the shelly lining of the tube.—594, 3 sp. of Imperator unguis, with Lith. in situ; in one, they have just reached the interior of the mouth; another is bored across the apex; the other, not finding room within, has increased its size by raising a tumulus

outside.—595, Imp. olivaceus, with bore across the apex.—596, do. with 5 Lith. in situ.—597, do. with upper part broken across, shewing an inner partition made by the animal to avoid the attacks of 2 Lithophagi; also a young Gastrochæna in situ.

Tablet 598 contains extremities of shelly tubes.—599, a large number of posterior extremities, to illustrate the variations of form.—600, fragments to shew the different layers, viz. internal shelly layer, medial epidermis, and external coating.

LITHOPHAGUS ARISTATUS, *var.* GRACILIOR: *formâ exiliori, "L. attenuatum" simulante, sed appendicibus curvatis. Long.* 1·15, *cujus* ·22 *appendix est, lat.* ·3, *alt.* ·33.

Tablet 601 contains 7 sp. of different ages.

LITHOPHAGUS ARISTATUS, *var.* TUMIDIOR: *formâ tumidiori, curtâ, ad L. cinnamomeum prope accedente. Long.* 1·54, *cujus* ·35 *appendix est, lat.* ·53, *alt.* ·58.

Tablet 602 contains 3 pairs and 1 valve, very young.—603, 3 sp. young and old. The extreme form of this variety was naturally regarded by Dr. Dunker as a distinct species.

177. LITHOPHAGUS CINNAMOMEUS, *Chemn.*

Mytilus cinnamomeus, *Conch. Cab.* vol. viii, pl. 82, f. 731.—*Encycl.* pl. 221, f. 4.—*Desh. Enc. Méth.* Vers, pl. 2, p. 566, no. 25.

Modiola cinnamomea, *Lam. An. s. Vert.* vol. vii. p. 25, no. 18.—*Hanl. Descr. Cat.* p. 238.

Lithodomus cinnamomeus, *B. M. Cat. Cub. Moll.* p. 45, no. 539.

Lithophagus cinnamomeus, *Dkr.* in lit.

One perfect valve only was found that could be certainly identified with this species. So weak however was the shelly matter, that on being placed in hot water the cuticle ran into shreds, breaking it to pieces. According to Dunker, the species is of wide distribution, and variable in colour, being brown, chesnut, or cinnamon. This specimen was blackish brown, about an inch long.

Hab.—Mauritius, Lamarck.—Philippines, Dunker.—Cuba, *Sagra.*—Central America, Dunker.—St. Thomas, *Hornbeck.*—Venezuela, (Porto Cabello,) *Tams.*—Mazatlan; ex-

tremely rare, burrowing in Chama; *L'pool Col.*—Fossil, near Rome, Lamarck.

Tablet 604 contains the remains of the valve.

Sub-genus LEIOSOLENUS.

Animal profunde in matricem penetrans, cameram capacem, politam excavans, partem derelictam explens præter tubum lævem partim bilobatum, ? siphones longos tenentem. Testa Lithophago similis.

If the animal, when examined, proves to have long, excurrent siphons, it must take generic rank perhaps in the neighbourhood of Mytilimeria, *Conr.*

178. Leiosolenus spatiosus, *n. s.*

S. t. dactyliformi, tenuissimâ, curtiori; postice concentrice undulatâ; umbonibus celatis; incrustatione calcariâ, tenui, æqualiter totam superficiem tegente, plerumque pustulis transverse confluentibus munitâ; marginibus antice et postice rotundatis, ventraliter subexcurvatis; lineâ cardinali prælongâ, margine dorsali curvato, subangulato, curtissimo. Camerâ obovali, spatiosâ, nitidissimâ: tubo nitido plus minusve elongato, juxta cameram contracto, postice bilobato.

Several chambers of this remarkable shell were found by Mr. Darbishire; always in the lower valves of Spondylus, and generally open as if part of the burrow were excavated in the rock. This may account for the loss of the shells except in a single instance. In the largest specimen, presented by him to the Br. Mus., are seen two chambers, which, from the long bilobed pipe of one of them, might be taken for the work of an enormous Gastrochæna. The pipes are however perfectly smooth within, while in Gastrochæna they are corrugated. The bilobation is only at the extremities, the rest of the pipe being irregularly circular, and much contracted at its junction with the cell. As there is no evidence of pallial sinus in the shell (though it may possibly exist,) it is probable that the contraction of the siphons takes place outside the body of the animal. From an examination of a specimen broken in the line of axis of the cell and pipe, it appears that the creature begins life with the shortest possible tube and a somewhat conical cell: as it burrows deeper, it not only fills up the corresponding posterior space with concentric layers of shelly deposit, pierced by the pipe; but also proportionally shortens

the cell, leaving it of a produced ovoid. It is large enough to allow of considerable expansion and revolution of the shell within: but so far from showing marks of friction, the internal coating of both cell and pipe are very glossy. The deposit is sometimes ·4 thick.

The animal is gregarious: ten burrows having been found in one Spondylus valve, of which six appeared of more recent date than the rest, being carried across the others. One of these, in crossing a burrow of its predecessor, had obliterated one half of the valves of the dead shell, and built-in the remaining portion with the wall of the new cell; another had cut across and cemented a Cumingia in the same way.

The shell is short, bent, scarcely angled at the dorsal margin, well rounded at the ends, and slightly excurved in front. The hinge line is very long, with the usual sharp ridge within. It is not sufficiently fresh to display the muscular impressions distinctly. There are no projecting incrustations; the deposit being thin and equally diffused. The shape of the shell is not such as would have been predicated from the form of its habitation; which had given rise to many surmises, before the shell now described was found entombed, without possibility of error. This shell, which is somewhat young, measures *long.* 1·5, *lat.* ·55, *alt.* ·47; its cell is ·65 across. The largest cell measures *long.* 3·26, *lat.* 1·2: its tube, *long.* 1·6, *lat.* (in the middle) ·3, *alt.* ·2.

Hab.—Mazatlan; extremely rare, in attached valves of Spondylus calcifer; *L'pool Col.*

Tablet 605 contains a young shell ·06 in length, which may belong to this species, though its affiliation cannot be determined without a series. It may possibly be a young L. cinnamomeus. Also a fragment of a large shell.—606, Spondylus valve, containing the two largest burrows, unfortunately broken in obtaining a cast: also burrows of Gastrochæna truncata, &c.

179. Leiosolenus ————, *sp. ind.*

One specimen was found by Mr. Darbishire, differing from the rest in the following particulars. Shell much shorter, broader, and with the hinge line and dorsal margin at a much smaller angle. Cell not so smooth, with dark gray walls, scarcely polished. Pipe emerging without any contraction, but with a raised ridge within the cell. The shell being very much decomposed was unfortunately broken to pieces in extraction.

Hab.—Mazatlan; 1 sp. in Spondylus; *L'pool Col.*
Tablet 607 contains a sketch.

Family ARCADÆ.

Genus ARCA, *Linn.*

Arca, pars, *Linn. Lam.* Arca, *Swains.* 1840.—Senilia, *Gray*, 1848.

The Arcæ appear to divide themselves into two natural groups, those which live freely in sand or mud, like cockles, whose name they commonly bear; and those which live nestling in crevices or affixed to rocks by a horny byssoid pedal appendage. The former have stout, regular, strongly ribbed shells, and are considered by Swainson the typical species; the latter have irregular shells, generally with a thin or shaggy epidermis, and a more or less developed ventral gape. These, which are the typical species of most authors, form Swainson's genus Byssoarca.

180. Arca grandis, *Brod. & Sow.*

Zool. Journ. vol. iv. p. 365.—*Rve. Conch. Ic.* pl. 1, f. 4.—*Hanl. Descr. Cat.* p. 160.—*B. M. Cat. D'Orb. Moll.* p. 82, no. 729.—*C. B. Ad. Pan. Shells*, p. 259, no. 417.

This species, the W. Pacific analogue of the East Indian A. senilis, is known from it by the greater number of ribs, (25-30) and by the teeth which are comparatively narrow. They are however wider than in A. tuberculosa. The shell in its young state is generally subæquilateral, subquadrate, often slightly inæquivalve, with the epidermis for the most part smooth and persistent, displaying here and there hairs, and cancellating scales across the grooves. The ribs are then often granulose. As it advances to maturity, the posterior part generally becomes much produced, till the aspect of the shell becomes very inæquilateral, and not unlike that of A. tuberculosa. It may however always be distinguished from it by its greater solidity, the smaller number of ribs, and by the grooves which nearly equal the ribs in breadth. The epidermis gradually becomes thick and rough, forming in concentric layers, which are very conspicuous across the grooves. The umbonal portion generally becomes decorticated. The ligament is coarse and solid, filling up the whole of the hinge area except a

smooth border all round. The teeth are normally numerous, strong, and nearly straight, scarcely shewing the middle point. The extreme teeth are sometimes broken into tubercles. Often however they become very small or even obsolete. Sometimes long callous processes are formed inside the line of teeth, which, when much developed while the teeth are obsolete, present a striking resemblance to the fossil genus Macrodon. Although the Mazatlan shells are not so large as those from Panama (one valve of which weighed 2·25lb, *C. B. Ad.*), yet a single pair weighed 3·6lb.

In the following measurements, the length is taken (1) from the umbo to the middle of the opposite margin, and (2) from the middle of the hinge to the nearest point across. The fifth column gives the distance between the umbos.

	long. (1)	*long.* (2)	*lat.*	*alt.*	*umb. dist.*
Youngest sp. transverse,	·85,	·73,	1·14,	·7,	·06.
Young sp. produced,	1·,	·86,	1·18,	·77,	·1.
Largest sp.	5·,	3·2,	5·8,	4·7,	1·3.
Ovate sp.	3·65,	2·7,	4·9,	3·,	·55.
Inflated sp.	3·4,	2·1,	4·2,	3·8,	1·7.

Hab.—Real Llejos, Bay of Guayaquil, &c. *Cuming, Hinds.*—Ecuador, Guayaquil, *Fontaine*, D'Orbigny.—Panama; rare but large, half buried in mud and small algæ, under trees, a little above half tide level; *C. B. Adams.*—Mazatlan; very common; *L'pool & Havre Coll.*

Tablet 608 contains 5 specimens, square form, young.—609, 2 sp. do. adult.—610, the largest sp.—611, 4 sp. young, slightly transverse.—612, 1 do. adult.—613, 1 do. large.—614, 4 sp. young, produced, shape approaching A. tuberculosa.—615, 1 do. adult.—616, 4 sp. transverse.—617, 4 sp. gibbous, young.—618, 1 do. adolescent.—619, 2 do. adult.

Specimens exhibiting the inside. Tablet 620 contains 3 sp. young.—621, 1 do. valves interlocking.—622, 1 do. adult, broad teeth, "Macrodon" processes distinct.—623, 1 do. hinge narrower, callosity within, running from umbo.—624, 1 do. hinge and processes developed, margin in layers, probably from intrusion of dirt.—625, 1 do. teeth obsolete, processes distinct.—626, 1 do. hinge line narrowed off, teeth only shewing at extremities.—627, 1 do. posterior hinge margin fractured and partially mended, shewing the teeth of an earlier age.

181. ARCA MULTICOSTATA, *Sow.*

Proc. Zool. Soc. 1833, p. 21.—*Rve. Conch. Ic,* pl. 4, f. 23.—*Hanl. Rec. Shells,* pl. 19, f. 12.

One very fine specimen of this shell was found by Mr. Archer. It differs from A. grandis in being much lighter, with more numerous ribs, and a squarer form. *Long.* 2·65, *lat.* 3·16, *alt.* 2·36.

Hab.—Gulf of Tehuantepec, 12 fm., *Cuming*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 628 contains a very small valve, ·15 across, which may belong to this species.—629, a drawing of Mr. Archer's specimen.

182. ARCA ? LABIATA, *Sow.*

Proc. Zool. Soc. 1833, p. 21.—*Rve. Conch. Ic.* pl. 1, f. 7.—*Hanl. Descr. Cat.* p. 160.—*B. M. Cat. D'Orb. Moll.* p. 81, no. 720.

Comp. A. labiosa, *Sow.* loc. cit.—*Rve. Conch. Ic.* pl. 10, f. 67.—*Hanl. Descr. Cat.* p. 159, pl. 19, f. 3.—*B. M. Cat. D'Orb. Moll.* p. 81, no. 720.

Comp. A. incongrua, *Say, Journ. Ac. Nat. Sc. Phil.* vol. ii. p. 268.—*Hanl. Descr. Cat.* p. 159.

The three species above quoted are very nearly allied. The two specimens found in the L'pool Col. by Messrs. Hibbert and Archer, before it fell into the dealer's hands, are exactly like the specimens brought from Florida, by *J. J. Audubon.* Shell with distant beaks, and strong ligament filling up a large rhomboidal area. Shape subangular; tubercles absent from the angular part, also from the front of the smaller valve. Teeth rather broad. *Long.* (from umbo) 1·23, *lat.* 1·3, *alt.* 1·04.

Hab.—Real Llejos and Tumbez, Peru, in sandy mud, 7 fm, *Cuming.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 630 contains a specimen, presented by J. Hibbert, Esq.

183. ARCA BIFRONS, *n. s.*

A. t. turgidâ, subquadratâ, tenui, maxime inæquivalvi, postice angulatâ, umbonibus haud distantibus; albâ, epidermide lævi, olivaceâ indutâ; costis circiter XXX., *in testâ juniore omnibus tuberculosis; in adultâ solum* VIII.—X. *anticis, reliquis lævibus; costis ventralibus in valvâ minore parvis, rotundatis,*

interstitia haud æquantibus; in valvâ majore planatis, subobsoletis, interstitiis minimis; ligamento solido, aream rhomboideam implente; dent. card. in lineâ curvâ; parvis; margine valvæ majoris effosso, valvam alteram recipiendo; costibus propter tenuitatem intus monstrantibus.

The above description is written from three beautiful examples in the Museum of Hugh Cuming, Esq. Fragments only of young shells were found in the L'pool collection, which however probably belong to the same species. It is known from A. incongrua and its congeners by its light structure, smooth epidermis, and especially by the ribs which are very narrow on one valve with wide interstices, on the other broad and flat, scarcely divided. There is a corresponding difference in the crenations of the valves. *Long.* 1·55, *lat.* 1·73, *alt.* 1·32.

Hab.—Mazatlan, Mus. Cuming.—Do; fragments on Spondylus calcifer; *L'pool Col.*

Tablet 631 contains the fragments.

184. ARCA TUBERCULOSA, *Sow.*

Proc. Zool. Soc. 1833, p. 19.—*Müll. Syn. Test. Viv.* p. 179.—*Phil. Abbild.* I. pl. 1, f. 2.—*Rve. Conch. Ic.* pl. 3, f. 18.—*Hanl. Descr. Cat.* p. 161, pl. 18, f. 53.—*C. B. Ad. Pan. Shells*, p. 263, no. 425.

Comp. Arca similis, *C. B. Ad. Pan. Shells*, p. 262, no. 422.

Shape varying from subquadrate, subæquilateral, to very transverse, with the posterior part much produced; sometimes flattened, sometimes extremely swollen. Ribs very numerous (about 36), close, slightly and irregularly tuberculous, often shewing concentric ridges of growth. Epidermis dark brown, coarse, deciduous near the umbos, with short scaly hairs in the intercostal spaces, and sometimes finer hairs on the posterior part. Inside white: teeth numerous, rather broad. Ligament coarse, solid, entirely filling up the rather narrow area between the beaks. Hinge line sometimes rounded off. The largest specimen measures *long.* 2·78, *lat.* 3·67, *alt.* 2·5.

A squarish „ „ „ 2·, „ 2·35, „ 1·5.
A swollen „ „ „ 2·45, „ 3·, „ 2·35.

Hab.—Real Llejos, at roots of Mangrove trees, low water, *Cuming.*—Panama, in impalpable mud, under a Mangrove thicket, near high water mark, not uncommon, *C. B. Adams.*—Mazatlan; very common; *L'pool & Havre Coll.*

Tablet 632 contains 2 specimens, squarish form.—633, 5 do. fine flattened growth.—634, 5 do. normal growth.—635, 3 do. swollen, produced.—636, 3 do. swollen, oval.—637, 4 sp. shewing the inside, one normal, another with the anterior teeth irregular, the third with the teeth nearly obsolete, the fourth do. quite obsolete, apparently from disease.

185. ARCA REVERSA, *Gray*.

Sow. in *Proc. Zool. Soc.* 1833, p. 20.—*Müll. Syn. Test. Viv.* p. 180.—*Rve. Conch. Ic.* pl. 1, f. 5.—*B. M. Cat. D'Orb. Moll.* p. 81, no. 722.—*C. B. Ad. Pan. Shells*, p. 261, no. 421.
Arca hemicardium, *Koch* in *Phil. Abbild.* pl. 1, f. 1. 1843.

This aberrant species is known at once by the truncation of the anterior portion. The ligament is cut off at right angles between the umbos, (which are not distant) and is solid, occupying the posterior area. The posterior line of teeth begins from the umbo; the anterior begins from a point nearer the middle, lying within the other, and is very short. There is a slightly developed ridge bounding the anterior adductor, as in Cucullæa. *Long.* 1·7, *lat.* 2·15, *alt.* 1·5.

Hab.—Tumbez, Peru, in soft mud, 7 fm., *Cuming, D'Orbigny.*—Panama, extremely rare, *C. B. Adams.*—Mazatlan; 2 fine specimens only were found by Mr. Archer; *L'pool Col.*

Tablet 638 contains one specimen.

186. ARCA ? BREVIFRONS, *Sow.*

Proc. Zool. Soc. 1833, p. 22.—*Rve. Conch. Ic.* pl. 1, f. 6.

In consequence of the internal characters not being given, the species cannot be determined with accuracy, but it fits the description as far as it goes. Epidermis as in A. multicostata, very finely striated along the radiating ribs, coarsely rugose between. Umbos approximate; ligament very long and narrow. Inside white, with a subumbonal stain as in A. emarginata. Posterior hinge teeth in a long slightly curved line: anterior somewhat twisted, in a short line at a decided angle. The teeth resemble A. reversa. *Long.* ·59, *lat.* ·48, *alt.* ·33.

Hab.—Tumbez, Peru; in soft mud, 7 fm.; *Cuming.*—Mazatlan; 1 sp. on Murex nigritus, with A. emarginata; *L'pool Col.*

Tablet 639 contains the specimen.

187. ARCA EMARGINATA, *Sow.*

Proc. Zool. Soc. 1833, p. 20.—*Müll. Syn. Test. Viv.* p. 180.—*Rve. Conch. Ic.* pl. 4, f. 26.—*Hanl. Descr. Cat.* p. 161, pl. 18, f. 60.—*B. M. Cat. D'Orb. Moll.* p. 81, no. 723.—*C. B. Ad. Pan. Shells*, p. 258, no. 415.

Although classed by Sby. among the æquivalves, he rightly describes it as inæquivalve, the posterior ventral part considerably overlapping, even in young shells. Umbos separated by a narrow triangular area. Ligament in very young shells only adhering posteriorly: afterwards filling a triangular space to the beaks; when adult displaying also a thin film on the anterior portion. Teeth strong, not very numerous, both rows forming a regular, slightly curved line, not reaching into the wing. Emargination not developed in young shells, variable in adult. Very young shell smooth: afterwards beautifully coloured with irregular dark chocolate undulating bands, and an interior spot radiating from the umbos. The smallest specimen is ·03 across: the largest (valve) *long.* ·5, *lat.* ·9, *alt.* ·35.

Hab.—Atacamas, Real Llejos, Xipixapi, Panama; in sandy mud, 6-8 fm.; *Cuming.*—Do.; *D'Orbigny.*—Panama, very rare; *C. B. Adams.*—Gulf of California, Mus. Cuming.—Mazatlan; young on Spondylus calcifer, adult on Murex nigritus, extremely rare; *L'pool Col.*

Tablet 640 contains 4 sp. young.—641, the largest valve.

188. ARCA————, *jun., sp. ind.*

Comp. Byssoarca alternata, *Sow. Proc. Zool. Soc.* 1833, p. 17.—(Arca a.) *C. B. Ad. Pan. Shells*, p. 257, no. 413. *(Hab.* W. Columbia, *Cuming:* Panama, *C. B. Adams:* Mazatlan, *Col. Jewett.)*

Tablet 642 contains 2 small opposite valves, the largest ·06 across, remarkable for the structure of the hinge, which is bounded not by one but by two lines, one of which radiates from the umbo, and between which probably the ligament is fixed. Outside are concentric irregular lines near the umbo, afterwards about 40 well rounded regular ribs, with equal interstices and strong plications within. It is clearly a young shell; too young to determine even the generic section with confidence.

Hab.—Mazatlan; off Spondylus calcifer, extremely rare; *L'pool Col.*

Genus BYSSOARCA, *Swains.*

Arca, sp. typ. *Linn., auct.*—Cibota, *Brown.*—Daphne, *Poli.*—Navicula, *Blainv.* 1818 (teste *Gray.*) non *Spix.*—Byssoarca, *Swains.* 1835.*

189. Byssoarca Pacifica, *Sow.*

Proc. Zool. Soc. 1833, p. 17.

Arca Pacifica, *Rve. Conch. Ic.* pl. 11, f. 75.—*Hanl. Rec. Shells,* pl. 18. f. 59.—*B. M. Cat. D'Orb. Moll.* p. 8 2, no. 735.

This magnificent species is known from B. Noæ and its congeners by its very large size, extremely swollen development of the posterior portion, coarse ribs, large indentation near the posterior hinge-angle, and the strong laminated gill-like epidermis, which lies in very conspicuous striated folds round the large byssal opening. It varies greatly in shape, sometimes not displaying the above characters, but presenting a tolerably uniform outline and small pedal opening. The byssal foot has a hard horny case, grooved inside. It scarcely projects beyond the shell. Teeth extremely numerous, sharp, generally narrow, sometimes rather broad. Ligament very thin, distributed in a lozenge over the whole area except the margin, with coarser lines radiating from the umbos, and sometimes others irregularly crossing these. The smallest of the specimens measures *long.* ·77, *lat.* 1·4, *alt.* ·8.

A narrow sp. ... „ 2·2, „ 3·6, „ 2·8.

The largest sp. „ 3·, „ 5·5, „ 4·.

This sp. measures inside from middle of hinge to ventral margin 1·3; from posterior end do. 2·4; projection of umbos 1·2; distance between umbos 1·8.

Hab.—St. Elena; on rocky ground, 6-18 fm., adhering to each other in large bunches; *Cuming.*—Ecuador, St. Elena, *D'Orbigny.*—Bijeoga Is. *Capt. Beaufort,* B. M.—Mazatlan; rare, but very fine; *L'pool Col.*

Tablet 643 contains 1 valve, ·03 across, probably belonging to this species.

Tablet 644 contains 2 sp. young.—645, 2 sp. adolescent; 'Macrodon' teeth, branching from the centre, very conspicuous on one side; in the larger sp. the hinge teeth are abnormally broad.—646, sp. not produced, incrusted with coral.—647, the largest sp.—648, stone incrusted with Bryozoa, with byssal foot attached.

* Mr. A. Adams names these shells *Arca*, and the previous species *Scapharca*, Gray.

190. BYSSOARCA MUTABILIS, *Sow.*

Proc. Zool. Soc. 1833, p. 17.

Arca mutabilis, *Rve. Conch. Ic.* pl. 13 f. 85.—*Hanl. Descr. Cat.* p. 156, pl. 18, f. 52.—*B. M. Cat. D'Orb. Moll.* p. 82, no. 733.—*C. B. Ad. Pan. Shells*, p 259, no. 418.

Compare Arca Americana, *D'Orb.* (non *Gray,) B. M. Cat. D'Orb. Moll.* p. 80, no. 714 (Brazils): *B. M. Cat. Cuba Moll.* p. 43, no. 521.—? = A. imbricata, *Brug.* (Jamaica, *C. B. Ad.*; Natal, B. M.)—A very similar, perhaps identical species is from Australia, *Jukes.*

Shell greatly resembling the Europæan B. tetragona, but differing from it as follows. Epidermis in B. tetragona hairy, even on the angular ridge; in B. mutabilis sublamellose, as in B. Pacifica, with the lamellar portions gill-like. Ligament in B. tetragona scarcely shewing over the area, but with numerous diamonds between the umbos; in B. mutabilis darkly diffused over the whole area, with or without one or two diamonds at the umbos. Teeth in B. mutabilis very numerous, as in B. Pacifica; in B. tetragona larger and fewer, somewhat remote. Posterior portion in B. mutabilis strongly ribbed; in B. tetragona, like the rest of the shell. It is distinguished from the young of B. Pacifica, which it very much resembles in form, by the posterior ribs and the epidermal ridge along the posterior angle. Pedal gape generally large. In young shells the structure under the glass is very beautiful. I am unable to find any constant character by which the West Indian specimens can be separated from it, though the shape somewhat differs; and the smaller ribs are more imbricated. The same form is from Natal, B. M. Among the best characters to distinguish Byssoarks are the form and nature of the ligament, the hinge teeth, and the epidermis. The markings and outline, as well as the inter-umbonal space, often vary considerably in the same species. The more constant characters are however often overlooked in descriptions. *Long.* ·8, *lat.* 1·35, *alt.* ·72.

Hab.—Isle of Plata, under stones, *Cuming.*—Ecuador, *D'Orbigny.*—Panama and Taboga; not uncommon under stones and in the crevices of rocks, near low water mark; *C. B. Adams.*—Mazatlan; rare: *L'pool Col.*

Tablet 649 contains 7 specimens differing in age and shape.

191. Byssoarca fusca, *Brug.*

Arca fusca; *Brug. Dict.* no. 10.—*D'Avila, Cat.* vol. i. pl. 7, f. R.—*Encycl.* pl. 308, f. 5.—*Dillw. Cat.* vol. i. p. 231, no. 14.—*Lam. An. s. Vert.* vol. vi. p. 466, no. 14.—*Rve. Conch. Ic.* pl. 12, f. 82.—*B. M. Cat. Cuba Moll.* p. 43, no. 523.

Arca barbata, var. *Gmel.* p. 3307.—*Schrot. Einl.* vol. iii. p. 279, no. 2.—*List. Conch.* pl. 231, f. 65.—*Gualt. Test.* pl. 90, f. B.—*Chemn. Conch.* vol. vii. pl. 54, f. 534.

Arca bicolorata, *Chemn. Conch.* vol. xi. p. 243, pl. 204, f. 2007.—*Dillw. Cat.* vol. i. p. 230, no. 11.

The presence of this well-known East Indian shell in the Mazatlan fauna is very suspicious. I took one fresh pair, and Mr. Darbishire another, out of the Byssoarca box, when I first examined the Collection. As it is said to reach the West Indies, it may linger also in the Gulf seas; or these specimens may have come over on ship bottoms or drifting timber, or in ballast; or they may, in some unaccounted way, have found an entrance into their appropriate box by an accident of the owner's. A small oyster attached is not distinguishable from the Mazatlan species; but this does not prove much. *Long.* 1·24, *lat.* 1·98. *alt.* ·27.

Hab.—Madagascar and Barbadoes, Lamarck.—"Singapore," abundant, *P. P. C.*—Barbadoes, (young valves) *P. P. C.*—Cuba, *Sagra.*—Mazatlan: extremely rare; *L'pool Col.*

Tablet 650 contains the specimen I found.

192. Byssoarca vespertilio, *n. s.*

B. t. oblongâ, compressâ, posticè tumidiore, expansâ; valde inæquilaterali, marginibus subrotundatis, hiatu pedis modico, margine ibi incurvo; umbonibus subappressis, ligamento longo, angusto, antice brevi; superficie radiatim striatâ, striis subimpressis, lineis incrementi vix decussatis; rubrofuscâ, intus maculis duabus ab umbonibus radiantibus; epidermide lamellis concentricis, antice squamosis, postice brevibus; setis interstitia decurrentibus, in lamellis imbutis; huc et illuc lineis setarum validis, longis, maximè latere postico, ubi semitubulares sunt; dentibus haud parvis, haud numerosis, lineis valde incurvatis, anticâ brevi.

Compare A. setigera, *Rve. Proc. Zool. Soc.* 1844, p. 124; *Conch. Ic.* pl. 14, f. 94. (Zanzibar, under stones at low water, *Thorn.*)

This species, belonging to the group of B. barbata, setigera, &c., appears peculiar in the structure of the epidermal lamellæ, in which are imbedded the rather strong hairs that run down each of the faint radiating grooves, presenting an appearance like a bat's wing, or the whalebones of an umbrella. At regular intervals over the surface is a row of larger hairs; those on the posterior part are long and stiff, curling round almost into a tube. Only one specimen was found in the boxes: a very few others obtained from a shop were probably from the same collection.—*Long.* ·76, *lat.* 1·3, *alt.* ·57.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 651 contains the specimen.

193. Byssoarca illota, *Sow.*

Proc. Zool. Soc. 1833, p. 18.

Arca illota, *Rve. Conch. Ic.* pl. 12, f. 78.—*Hanl. Rec. Shells*, pl. 18, f. 41.

Compare A. Tabogensis, *C. B. Ad. Pan. Shells*, p. 262, no, 424.

Shell, as usual, varying in form and markings; but generally with extremely fine sharp radiating ribs, and fainter concentric ones decussating on a smooth surface; the ribs being nodulous at the sides, and in the adult on the whole surface, when they become much larger. Epidermis as in B. Tabogensis, between pilose and lamellar, except on the ligamental area, where it is smooth and shining. Shape generally of the B. lactea type, but with very close umbos, inæquilateral, and flattened at the ventral margin. Sometimes this is considerably incurved. Hinge teeth few, rather small, in two unequal, slightly curved branches. Ligament solid, adhering only at the posterior part, whence it makes a fine curl round the umbos. A few large specimens were obtained from shops (probably from this collection) but only three small ones from the boxes. A rounded specimen measures *long.* ·64, *lat.* ·9, *alt.* ·55.

A produced sp. ,, ·7, ,, 1·2, ,, ·58.

Hab.—Gulf of Nicoya, under stones, *Cuming.*—Do. *Hinds*, B. M.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 652 contains a small pair from Mazatlan; and a large valve from a shop.

194. Byssoarca gradata, *Brod. & Sow.*

Arca gradata, *Zool Journ.* vol. iv. p. 365.—*Gray* in *Zool. Beech. Voy* p. 152, pl. 43, f. 1.—*Rve. Conch. Ic.* pl. 14, f. 92.—

Haml. Descr. Cat. p. 155, pl. 18, f. 39.—*B. M. Cat. D'Orb. Moll.* p. 81, no. 725.—*C. B. Ad. Pan. Shells*, p. 258, no. 416. =(Teste *Krauss, Sudafr. Moll.* p. 16) Arca squamosa, *Lam. An. s. Vert.* vi. p. 474, no. 35.—*Hanl. Descr. Cat.* p. 158,— =(teste *Desh.)* Arca Domingensis, *Lam. A. s. V.* vi. p. 467, no. 16. (differing in colour.)—=(teste *Desh.)* Arca clathrata, *Defr. A. s. V.* vi. p. 478, no. 6, (fossil.)

Compare Byssoarca divaricata *Sow. Proc. Zool. Soc.* 1833, p. 18:—(Arca d.) *Rve. Conch. Ic.* pl. 16, f. 108. (Annaa or Chain Is. attached to stones, *Cuming;* W. Indies, B. M.)

Comp. Byssoarca pusilla, *Sow. Proc. Zool. Soc.* 1833, p. 18:—(Arca p.) *B. M. Cat. D'Orb. Moll.* p. 81, no. 717. (Iquiqui, Peru, on stones at low water, *Cuming;* Bolivia, Cobija, Peru, Arica, *D'Orbigny.)*

Comp. Arca donaciformis, *Rve. Conch. Ic.* pl. 16, f. 104;— *Proc. Zool. Soc.* 1844, p. 125, (Mozambique Channel, in Madrepore, *Hankey.)*

This species varies considerably in the fineness or coarseness of the cancellated markings, in the projection or otherwise of the posterior rib, and in the shape, which often approximates B. solida, and is not unfrequently greatly appressed. Ligament very narrow, solid, only adhering at the posterior part, whence it makes a slight turn round the umbos, as in B. illota. Hinge teeth rather few, slanting, on unequal lines slightly diverging. Muscular scars prominent, glossy white, as though on a single plate attached to the shell. The pedal chink is perceptible, but very small. These characters include specimens from the W. Indies, which are undoubtedly A. squamosa, Lam. also quoted by Krauss from Natal. If, as is probable, the species are identical, the Lamarckian name has priority. Another W. Indian species, probably A. umbonata, *A. s. v.* p. 462, no. 5., differs in the fineness of the cancellations, and in the ligament which fills a central pit, as in B. solida. The A. pusilla of D'Orb. may be a dwarf var. of the Mazatlan shell, but the Cumingian type appears distinct. A specimen of the typical form measures *long.* ·47, *lat.* ·83, *alt.* ·38.

Hab.—Mazatlan, *Beechey's Voyage*:—Do. rare, nestling in crevices of large shells; *L'pool Col.*—Sta. Elena, attached to stones, *Cuming.*—Ecuador, Sta. Elena, *D'Orbigny.*—Sta. Barbara, *Col. Jewitt.*—Taboga; under stones near low water mark, very rare; *C. B. Adams.*—Also given from Ld. Hood's Is. and the Marquesas.—(A. squamosa.) "N. Hollande, a l'ile King, Mus." Lamarck.—Natal, *Krauss.*—(A. Domin-

gensis) St. Domingo, Lamarck:—W. Indies, Bristol Mus.—(A. clathrata) Fossil near Angers, Ménard.

Tablet 653 contains 6 very young pairs and 7 pairs of valves, extremely young, the smallest measuring ·04 by ·02, greatly varying in outline. The teeth are at first very few in number, and the internal ridge rather prominent.—654, a young pair nestled, in situ, in fragment of Spondylus calcifer; also 2 dried byssal feet.—655, 6 sp. young.—656, 8 adult sp., various shapes. Two sp. will also be found in situ on Chama (tablet 441.)

195. Byssoarca solida, *Sow.*

Proc. Zool. Soc. 1833, p. 18.—*Müll. Syn. Test. Viv.* p. 186. Arca solida, *Rve. Conch. Ic.* pl. 16, f. 106.—*Hanl. Descr. Cat.* p. 155, pl. 18, f. 54.—*B. M. Cat. D'Orb. Moll.* p. 81, no. 716.—*C. B. Ad. Pan. Shells*, p. 262, no. 423.

This unpretending species greatly resembles our B. lactea, and a similar W. Indian species; but differs from each by well marked characters. In this, the ligament is in a very narrow rhombus; in B. lactea, in a broad one; in the West Indian it fills nearly the whole area. In B. solida, the hinge teeth are nearly or quite obsolete within the ligament, even in young shells; in the other two species the teeth are in an uninterrupted line. The surface also in B. solida is generally decussated with concentric tubercles; but this character is not constant. Shape either flattened and produced, or short and much swollen. Epidermis brown, thin. Byssal foot extremely thin; ventral margin not perceptibly gaping.—

A finely grown specimen measures	*long.*	·35,	*lat.*	·56,	*alt.* ·28.
A swollen sp.	„	„	·34,	„	·47, „ ·43.
The largest sp.	„	„	·46,	„	·67, „ ·46.

Hab—Under stones at Payta, Peru, *Cuming, D'Orbigny.*—Panama and Taboga; not uncommon under stones near low water mark; *C. B. Adams.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 657 contains 5 pairs and 1 valve very young, the latter ·03 across; one pair is strongly decussated.—658, 5 sp. scarcely decussated.—659, 3 do. flat growth.—660, 3 do. with former margins projecting.—661, 3 do. swollen.—662, 3 do. very much swollen, umbos distant.—663, 3 sp. shewing the interior.

Genus PECTUNCULUS, *Lam.**

196. Pectunculus inæqualis, *Sow.*

Proc. Zool. Soc. 1832, pt. ii. p. 196: [non *Gray* in *Beech. Voy.* p. 152, pl. 42, f. 3: (v. *Rve.* in *P. Z. S.* 1843, p. 79;) nec *Krauss, Sudafr. Moll.* p. 18.] — *Hanl. Descr. Cat.* p. 166.— *Rve. Conch. Ic.* pl. 4, f. 16.

=P. Pectiniformis, *Wood Suppl.* pl. 2, f. 11, non *Lam.* (teste Hanl.)

?=P. assimilis, *Sow. Proc. Zool. Soc.* 1832, pt. ii. p. 196,—*Müll. Syn. Test. Viv.* p. 189.—*Rve. Conch. Ic.* pl. 4, f. 15.—*B. M. Cat. D'Orb. Moll.* p. 80. no. 712.—*C. B. Ad. Pan. Shells,* p. 256, no. 411.—*Hanl. Descr. Cat.* p. 167, note.

Only two specimens having been found adult of this extremely beautiful shell, no opportunity existed for ascertaining its power of variation; but C. B. Ad. thus remarks of P. assimilis, "In respect of colouring (no two being alike) the species does not appear to be well distinguished from P. inæqualis: nor is the distinction in sculpture much more constant." Surface of the shell with a variable, small number of ribs, covered, as well as the interstices, with fine ribs decussated in the "strung fig" pattern. Margin most beautifully crenated by each; interior surface covered with fine lines; anterior part short, ligament subtruncated. A very young valve, ·04 across, displays 3 teeth on each side, with the larger ribs only developed outside and decussated: ligament in a pit as in Limopsis. *Long.* 1·33, *lat.* 1·31, *alt.* ·9.

Hab.—Bay of Panama and Real Llejos; in sandy mud, 10 fm.; *Cuming.*—Mazatlan; extremely rare; *L'pool Col.*,—(P. assimilis) Puerto Portrero, Bay of Guayaquil; in sandy mud and gravel 8-12 fm.; *Cuming.*—Ecuador, Guayaquil, *D'Orbigny.*—Panama; under stones, in calcareous gravel, between one-quarter tide and low water mark, rare; *C. B. Adams.*—Mazatlan, *Lieut. Green.*

Tablet 664 contains the smallest valve.—665, the finest specimen.

197. Pectunculus ? multicostatus, *Sow.*

Proc. Zool. Soc. 1832, pt. ii. p. 195.—*Rve. Conch. Ic.* pl. 5, f. 26.—*Hanl. Descr. Cat.* p. 165, pl. 19, f. 36.—*B. M. Cat. D'Orb. Moll.* p. 80, no. 711.

* "The first name for these shells is Axinæa, *Poli.* If Pectunculus, *Lam.* (not *Adanson*) is to be used, it should be limited to the ribbed species." *A. Adams,* ms.

Tablet 666 contains a young valve; ·07 across, which may belong to this species. It is however white, with about 30 rounded ribs; inside with a remarkably straight hinge line.

Hab.—Ecuador, Guayaquil, *D'Orbigny.*—? Mazatlan; 1 valve, off Chama; *L'pool Col.*

Family NUCULIDÆ.

Genus NUCULA, *Lam.*

Nucula, *Lam.* 1801.—Polydonta, *Megerle*, 1811.

198. Nucula ? exigua, *Sow.*

Proc. Zool. Soc. 1832, p. 198.—*Müll. Syn. Test. Viv.* p. 192.—*Sow. Conch. Ill.* no. 34, pl. 16, f. 24.—*Hanl. Descr. Cat.* p. 172.—*B. M. Cat. D'Orb. Moll.* p. 79, no. 704.—*C. B. Ad. Pan. Shells*, p. 255, no. 409.

Tablet 667 contains one very young valve, ·03 across, which may belong to this species. The concentric grooves are just forming at the margin.

Hab.—Bay of Caraccas, in sandy mud, 9 fm.; *Cuming, D'Orbigny.*—Panama, 1 valve, *C. B. Adams.*—Mazatlan; 1 valve off Spondylus calcifer; *L'pool Col.*

Genus LEDA, *Schum.*

199. Leda ? Elenensis, *Sow.*

Nucula Elenensis, *Proc. Zool. Soc.* 1832, p. 198.—*Müll. Syn. Test. Viv.* p. 191.—*Sow. Conch. Ill.* no. 19 pl. 15, f. 14.—*Rve. Conch. Syst.* pl. 85, f. 14.—*Hanl. Descr. Cat.* p. 169.—*C. B. Ad. Pan. Shells*, p. 254, no. 408.

Leda Elenensis, *B. M. Cat. D'Orb. Moll.* p. 63, no. 554.

Tablet 668 contains a minute valve, ·06 by ·04, which may belong to this species. Transparent, concentrically grooved, but (as in C. B. Adams' specimens) margin not crenulated.

Hab.—St. Elena, in sandy mud, 6 fm. *Cuming, D'Orbigny.*—Panama, rare, *C. B. Adams.*—Mazatlan; 2 valves off Spondylus calcifer; *L'pool Col.*

Family AVICULIDÆ.

Genus PINNA *Linn.*

The remarkable similarity in form between the young shells of Isognomon and those of this genus, confirms the opinion of Dr. W. B. Carpenter (Br. Assoc. Rep. 1833, p. 20,) and, Prof. E. Forbes (Br. Moll. vol. ii. p. 250,) that it ranks in the present family. An abundance of large Pinnæ, sent in the Liverpool Col., were unfortunately sold off at once to the keeper of a tea garden, where they may be seen built up into the walls, and too much disfigured to allow of the species being identified. To add to the confusion, an importation of large Pinnæ from New Guinea having reached Liverpool at the same time, were mixed with them, both in the shop, and in the garden walls; and some have found their way into collections as though from Mazatlan. A similar confusion seems to have attended the Pinnæ sold in London with the Havre Col., on some of which the attached Vermetidæ, corals, &c. clearly prove that they came from far distant seas. The three following species are all that can be quoted with certainty as having been found in the Mazatlan boxes. Another species, like P. maura, but remarkable for its extreme breadth and thickness and for the shape of the anterior muscular impression which displays a series of ripples, was sent in the S. W. Mexican collection. Some species of this genus alter considerably in the shape of the posterior extremity, as they attain maturity. The measurements are taken as in Mytilidæ.

200. Pinna maura, *Sow.*

Proc. Zool. Soc. 1835, p. 84.—*Hanl. Descr. Cat.* p. 255.—*C. B. Ad. Pan. Shells*, p. 250, no. 395.

Adolescent shell dark brown, with about 18 rows of irregular scales; here and there almost tubular; dark brown; posterior end produced, margin rather straight, ventral edge smooth, slightly inflated; hinge line incurved near the umbos; anterior impression bilobed. *Long.* 8·5, *lat.* 4·5, *alt.* 1·58.

Hab.—Panama, in muddy banks, *Cuming*,—Do., extremely rare, *C. B. Adams.*—Mazatlan; probably common, as Lieut. Belcher (Zool. Journ. vol. iv. p. 362) speaks of the large and dangerous shoals of Pinnæ in the harbour, which cut boats with their sharp edges; *L'pool Col.*

Tablet 669 contains one of the very few specimens saved.

201. PINNA LANCEOLATA, *Sow.*

Proc. Zool. Soc. 1835, p. 84.—*Hanl. Descr. Cat.* p. 256.

Shell, when extremely young, nearly smooth with a very long hinge line, but much shortened posteriorly: gradually developing radiating ridges, 8-10 in the adult, which become furnished with regular rows of long, almost tubular spines, extremely thin, light horny brown, ventral part swollen and smooth, with the margin rounding off posteriorly till it meets the dorsal line at right angles. Hinge line often incurved near the umbos. The smallest specimen found is 1·75 long; the largest, *long.* 4·2, *lât.* 1·7, *alt.* (with spines ·77, without) ·28.

Hab.—Puerto Portrero; in sandy mud, 13 fm.; *Cuming.*—Mazatlan; in fine sand, not uncommon; *L'pool Col.*

Tablet 670 contains 3 sp. very young.—671, 2 do. older, with few rows of spines developed.—672, 4 do. ordinary state.—673, 2 do. crowded with tubercles.—674, 1 do. distorted growth.

202. PINNA ? RUGOSA, *Sow.*

Proc. Zool. Soc. 1835, p. 84.—*Hanl. Descr. Cat.* p. 256. P. rugosa, jun., teste *Cuming.*

About a score of specimens were found with P. lanceolata, presenting the following characters. Shell extremely thin, very light horn coloured, transparent, glossy, with the cell-structure so large as to be visible to the naked eye, giving a peculiar texture to the surface; very long and narrow, ventral part not inflated; with about 6 strong ribs, traceable from the umbos, and scarcely ceasing at the ventral part, armed with large, distant, nearly tubular spines. The smallest specimen is 1·9 long; the largest, *long.* 4·8, *lat.* 2·, *alt.* (with spines 1·2, without) ·64.

Hab.—Isle of Rey, Bay of Panama, on sand banks, *Cuming.*—? Mazatlan; very rare; *L'pool Col.*

Tablet 675 contains the smallest and the largest specimens.

GENUS AVICULA, *Klein.*

Avicula, *Klein*, 1753;—*Brug.* 1789;—*Lam.* 1799.
Pteria, *Scopoli*, 1777;—*Gray*, 1847.

203. AVICULA STERNA, *Gould.*

Proc. Bost. Soc. Nat. Hist. Nov. 1851, vol. iv. p. 93 :—*Mex. & Cal. Shells*, p. 31, pl. 16, f. 7.—*C. B. Ad. Pan. Shells*, p. 250, no. 392.

Avicula Atlantica, *Menke, Zeit. f. Mal.* 1847, p. 187, no. 45 ; non *Lam.*

"Has the general appearance of A. semisagitta, *Lam.* but the wing is less oblique, and curves directly into the cauda without any sinus ; the byssal sinus is deeper and much more acute, making a trapezoidal auricle. It most nearly resembles a Florida species ; but in that the byssal angle is obtuse, the auricle triangular, and the cauda shorter." *Gould.** The hinge line is generally extremely long, but sometimes so short that the anterior are rather larger than the posterior auricles. Shell very inæquivalve. Outer layer of shell dark chocolate, rarely slightly rayed with white. Surface almost smooth, with very fine concentric lines of growth. Epidermis in fine strongly serrated, closely folded laminæ. Hinge teeth, card. 2-1, lat. 1-1. The pallial line is traceable from the large bilobed posterior adductor to the small anterior, situated just below the cardinal teeth. A peculiar species of Balanus is commonly found on this shell, and on the related W. Indian species. Many specimens of Discoporæa intricata, and eggs of Gasteropods were also found attached. The smallest sp. is ·05 in length ; the largest 1·24. A normal sp. measures *long.* ·98, *lat.* 2·5, *alt.* ·42.
One with short hinge „ 1·23, „ 1·7, „ ·59.

Hab.—Panama, *Col. Jewett*,—Do. ; very rare, attached to a small species of Gorgonia, at the low water mark of the spring tides ; *C. B. Adams.*—Mazatlan ; not uncommon ; *L'pool Col.*

Tablet 676 contains a minute valve, ·05 long, with the lateral tooth conspicuous.—677, 7 young pairs of different sizes, (one with egg cases) and a valve shewing spotted umbo.—678, 4 sp. adult.—679, 3 do. shewing interior.—680, 4 sp. different ages, with the 'ear,' 'wing' or 'tail' very much shortened ; the larger with Discoporæa intricata.

* Dr. Gould's 'wing' appears to be the body of the shell ; his 'cauda' what is by others called the wing or the ear.

Subgenus MARGARITIPHORA, *Meg.*

Megerle v. Mühlfeld, 1811.—Meleagrina, *Lam.* 1819.

204. Margaritiphora Mazatlanica, *Hanl.*

Melcagrina Mazatlanica, *Hanl. Rec. Shells*, pl. 24, f. 40.

No synonyms of the Pearl-oyster are given, as the question of the specific identity of the local types is not yet settled. The Gulf of California used to be celebrated for its pearl fishery, but it appears to have been exhausted, and very few oysters have been brought of late years. The specimens from S. W. Mexico appeared to belong to the Panama type, being small, produced and of a purplish brown. Of this shell in 1851 a single vessel brought 340 tons to Liverpool *(T. C. Archer.)* The other local types are the silver-lipped from the Society Is. and the black-lipped from Manilla. Which of these is the true M. margaritifera of Lam. has not yet been settled. In *Hanl. Descr. Cat.* are also quoted, p. 264, M. radiata from the P W. Indies, and M. albina from Australia. Mr. Nuttall found a pretty little species, quite distinct from the young of M. margaritifera, at the Sandwich Is. Pearl-oysters are also found at Madagascar, Persian Gulf, Ceylon, Swan River, &c. Very few specimens were sent in the Mazatlan collection, and of these only the young ones were preserved. Shell in that state transverse, not produced ventrally, one valve only pierced for the byssus, swollen at that part, else flat, spreading; with closely set overlapping laminæ, extremely thin, produced into foliations or flat spines; inside silvery white, nacre bordered with green, margin broad, of a light tortoiseshell colour. *Long.* 3·55, *lat.* 4·05, *alt.* 1·27, (jun.)

Hab.—Mazatlan; very rare; *L'pool & Havre Coll.*

Tablet 681 contains a very young valve, ·05 across, of nearly normal shape, known from the young of the neighbouring species by the enormous size of the prismatic cells.—682, the specimen above measured.

Genus ISOGNOMON, *Klein.*

Isognomon, *Klein*, 1753:—*Dkr.* in *Moll. Guin.*
Melina, *Retz*, 1788, *Diss.* p. 28:—*Schum.* 1817.
Perna, *Brug.* 1792:—*Lam.* 1801:—(non *Retz.*)
Sutura, *Meg. v. Mühlf.* 1811. *Entw.* p. 65.

Some confusion has arisen in this genus as in Pinna from a large number of the Malleus-shaped species from New Guinea having been brought at the same time with the Mazatlan collection, and having found their way into museums as though from this locality. The variations of form in these were most extraordinary.

205. Isognomon Chemnitzianum, *D'Orb.*

Perna Chemnitziana, *D'Orb. Sagra, Cuba*, vol. ii. p. 346.—*B. M. Cat* p. 46, no. 547.
Perna flexuosa, *Sow.* ms. in *Coll. Kellett, Mus. Pract. Geol*:—(do. Panama, *Lieut. Wood*, Bristol Mus.)
=Perna, sp. ind. *(a), C. B. Ad. Pan. Shells*, p. 250, no. 393.
Comp. Isognomon Perna, *Linn.* in *Dkr. Moll. Guin.* no. 116, pl. 8, f. 7-10:=(teste *Dkr.)* Ostrea perna, *List. Conch.* Tab. 199, f. 33.—*Chemn. Conch. Cab.* vol. vii. p. 252, pl. 59, f. 580.—*Schroet. Einl.* vol. iii. pl. 9, f. 5.—*Lam.* vii. p. 78, Perna vulsella, excl. var. *b.* [Common at St. Vincent and Loander, *Tams.* "Omnia plane respondent iis, quæ ex Antillis insulis et ex America centrali originem ducunt.=sine dubio, Concha semiaurita, var. *Chemn.* vol. vii. f. 580. (? f. 579,=P. radiata, *Anton Verz.* p. 17).] Non O. semiaurita *Schroet.* loc. cit. f. 6."

The Mazatlan shells are certainly the P. flexuosa of *Sow.* I cannot detect the slightest specific difference between these, and specimens collected at St. Vincent's (W. I.) by Dr. W. B. Carpenter. These are the P. Chemnitziana of *D'Orb.*, which name I have therefore adopted till the date of *Sow.'s* is known. Whether it is the shell quoted by *Dkr.* from Central America and W. I. as well as from Guinea, cannot in so variable a genus be decided only from descriptions and figures. The Mazatlan shells are small, very variable in shape, normally suborbicular, but generally produced. Shell with concentric irregular ridges of growth, but without sculpture on either valve. Beaks much produced, terminal; byssal portion incurved; ventral part flattened. Muscular impression extremely large: ligamental pits deep, numerous and regular. Colour ash, more or less stained with purple, especially at the ventral part, often very rich. The shell in its first appearance seems to be Cyrena-shaped, then like an inflated Anodon, then like Inoceramus, then for some time like a broad Pinna; then it gradually developes its true form, as far as is consistent with the crevice in which it has taken up its abode. One pit is de-

veloped (as a sinking in the otherwise Avicula-shaped ligament) at a very early stage; afterwards a second, and so onwards. The prismatic structure is not apparent at first, but soon develops at the ventral portion in cells intermediate in size between those of Avicula sterna and M. Mazatlanica, making the transparent young valves very beautiful objects. The size of the shell when the ligament pits appear, varies greatly; and the rapidity with which one individual will completely alter its form is most extraordinary. The largest valve measures ·03 across; an enormous specimen, *long.* 2·1, *lat.* 1·, *alt.* ·5.

One of normal shape „ „ 1·, „ ·7, „ ·24.
A produced one „ „ 1·53, „ ·51, „ ·16.

Hab.—Cuba, *Sagra.*—St. Vincent's, W. I.. *W. B. Carpenter.*—Conchagua, *Hinds.*—Panama, *Lieut. Wood.*—Mazatlan; not uncommon in crevices of large shells, affixed by a short strong byssus; *L'pool Col.*—(Perna *a.*) Panama; common under stones and in crevices of rocks at low water mark; *C. B. Adams.*—La Paz; *Lieut. Green.*

Tablet 683 contains 7 pairs of valves, extremely young.—684, 4 pairs and 2 pairs of valves, a stage older.—685, 6 pairs and 2 closed hinges, young.—686, 3 pairs adolescent.—687, 4 pairs adult, greatly varying in shape.—688, 2 sp. in situ, in crevices of Patella Mexicana, and in dead Balanus off do.

206. Isognomon Janus, *n. s.*

I. t. rhomboideâ, tenui, planatâ, pallidâ; valvâ inferiori lævi, superiori costis gracillimis, interdum obsoletis, testâ juniore spinis semitubulis imbricatâ; haud auritâ, angulo ad umbones acuto; marginibus ant. et post. subparallelis, subrectis: cardine ligamento ut in Aviculâ longo, fossibus perpaucis, minimis, irregulariter dispositis; imp. musc. haud magno.

Shell known from all the forms of I. Chemnitzii by its regular lozenge shape without ears, thin texture without concentric ridges, light colour, and by the sculpture of the valves of which the under is smooth, the upper ornamented with fine radiating striæ, which in the young shell are crowded with semitubular imbricated spines. The hinge line is narrow, without pits when young, when adult with a very few (4) small ones at unequal distances. Muscular impression much smaller than in I. Chemnitzii. The youngest shells are very inæquivalve, and display capped umbos, consisting of Venus-shaped

fry. It probably resembles P. costellata, *Conr.* from the Sandwich Is., but that is described as having both beaks alike. The smallest specimen is ·05 in length; the largest, *long.* (the diagonal of the lozenge) 1·12, *lat.* ·68, *alt.* ·17.

Hab.—Mazatlan; on I. Chemnitzii and Spondylus calcifer, extremely rare: *L'pool Col.*

Tablet 689 contains 1 pair and 2 valves, very young.—690, the most characteristic specimen, in situ.

Family PECTINIDÆ.

Genus PECTEN, *Müll.*

Of this (in most places) abundant genus only 3 very small valves were found. The neighbouring genus Lima was altogether absent.

207. Pecten circularis, *Sow.*

Proc. Zool. Soc. 1835, p. 110.—*Hanl. Descr. Cat.* p. 271.

Dull ash, variegated with chocolate; ears very large; interstices near the umbo finely decussated. The opposite valves differ in sculpture.—*Long.* ·28, *lat.* ·26, *alt.* ·12.

Hab.—Guaymas; in sandy mud, 7 fm.; Col. Cuming.—St. Vincent's [?] Hanley.—Mazatlan; extremely rare: *L'pool Col.*

Tablet 691 contains the only valve I found.

Family SPONDYLIDÆ.

Genus SPONDYLUS, *Linn.*

208. Spondylus calcifer, *n. s.*

S. t. maximâ, ponderosâ, solidâ, plerumque orbiculari; rubro-purpureo; valvâ superiore costis minimis aculeatis creberrimis tectâ, huc et illuc costis irregularibns squamosis; squamis curtis, ad basim arcuatis, supra foliatis; valvâ inferiore plerumque foliatâ; areâ ligamenti magnâ, ligamento haud tecto; intus subnacreâ, limbo lato toto purpureo, seu nonnumquam flavesco-rubente; margine extremo creberrimo et minute crenulato; dentibus validis; fossâ ligamenti canalibus 2-6 parallelis, decussatis; musc. imp. sub-orbiculari, magnâ.

Spondylus Lamarckii, *Hanley* ms.; et ibi supra, passim: non *Sow.*

Spondylus ?Lamarckii, *C. B. Ad. Pan. Shells*, p. 247, no 385.

This species has been quoted in the earlier pages of the foregoing Catalogue under the name of S. Lamarckii. The type of S. Lamarckii, however, is a very different shell, more like S. ducalis, of produced shape, with edges interlocking as in Pecten, and very coarsely crenated in addition: margin dark brownish purple, area not divided, teeth and ligament small. This shell most resembles S. dubius, *Brod. Proc. Zool. Soc.* 1833, p. 4: = S. pictorum, var. teste *Sow.* in *Thes. Conch.* It differs however in the very crowded rows of prickles over the surface; in the character of the spines, which are arcuated in S. dubius, spreading above in S. calcifer; and in the interior crenations which are very small in this shell, and scarcely seen in the adult. Mr. Cuming first saw the species, on a small island in the Bay of Panama, where the natives dive for them, to burn into lime; of which they must furnish an excellent supply, being solid, not in chambers as in most large Spondyli. He broke up many specimens for their contents, but they were too cumbrous for removal, "some of them being more than a foot high and a foot broad." The adult valves are known at once by the "broad deep red purple finely wrinkled limb of the otherwise white interior," *C. B. Ad.* In its younger stages however, it occasionally displays a salmon colour or even the orange tint of S. dubius. The species was not seen by Mr. Sowerby in preparing his monograph; but, Mr. J. S. jun., having directed my attention to many of the above characters, was satisfied of its distinctness.

The Mazatlan shells, when young enough to display their characters, are attached by a portion of the lower valve to rocks, large Pinnæ, &c. The valve develops irregular foliations, to aid the adherence. The ligament area is long, rather slanting, and with the groove open to the summit. The upper valve and the unattached portion of the lower are very finely radiately striated, the striæ being granulose, or developing short prickles. At very irregular intervals, there are very irregular and generally ill-developed ribs, which are here and there armed with vaulted scales, not large even in the young shell. The white, rather nacreous interior displays a broad marginal band, generally purple in the adult, very rarely reddish orange, which is the colour of the young shell. This margin is finely crenated. The muscular scar is very large, irregularly

suborbicular. The ligament has a variable number of longitudinal grooves, each broken up into portions like a necklace. The shell is generally suborbicular and massive (sometimes 6 in. thick, *Hanl.*), and affords a safe asylum not only for the ordinary boring and nestling bivalves, but for numerous small Gasteropods, especially Cœca, Odostomidæ, Vitrinellæ, Naricæ, &c., which establish themselves in empty burrows and in the galleries formed by numerous boring worms, in the coloured portion of the shell. The possession of a single valve therefore is quite a treasure to a patient conchologist; as, after working out the borers, he will find a plentiful supply of species among the debris. Most of the small shells described in this Catalogue were thus taken from the large Chamæ and Spondyli, by carefully passing the shell-washings through a fine wire sieve, and examining the remainder under the glass. A single specimen of Spondylus was found to contain the following species:—Parapholas calva, Gastrochæna ovata and truncata, Petricola robusta, Rupellaria linguafelis, Saxicava arctica, Sphænia fragilis, Cumingia 3 sp., Tellina 2 sp., Veneridæ 5 sp., Gouldia Pacifica and varians, Circe margarita, Cardita Californica, Cardium 2 sp., Lucina, 2 sp., Kellia suborbicularis, Lepton 2 sp., Mytilus 2 sp., Crenella, Septifer, Lithophagus aristatus and plumula, Byssoarca gradata and solida, Chama, Isognomon, Avicula, Anomia, Discina Cumingii, Bullidæ 2 sp., Chiton, Patella 2 sp., Siphonaria (2 varieties), Crepidula 2 sp., Fissurella 2 sp., Hipponyx, Vermetus 2 sp., Torinia, Trochus, Narica, Vitrinella 6 sp., Fossar, Littorina 2 sp., Rissoidæ 5 sp., Jeffreysia, Cerithiadæ 5 sp., Odostomia 6 sp., Chemnitzia 3 sp., Eulima 2 sp., Scalaria, Cæcum 5 sp., Columbella 5 sp., Nassa, and Marginella 2 sp: in all 103 species, of which 7 only were fragmentary. It is impossible to say how many more might have been rescued from oblivion, had not the original purchaser of the collection immediately sold off almost all the large shells to the keeper of a tea garden connected with a public house near Manchester, where they may be seen, the Pinnæ built up into grottos, and the Spondyli and large Patellæ arranged alternately round the skirting board of his "Museum." These shells were carefully washed by the publican's servant, and the precious dirt thrown away. Mr. Hanley was more fortunate, and obtained many fine specimens from the Havre Col. The largest specimen I obtained measures *long.* 7·, *lat.* 7·, *alt.* 6·5. The measurement was however taken after the shell had been decorticated to obtain the borers.

Hab.—Bay of Panama, in a few fathoms of water, *Cuming; C. B. Adams.*—La Paz; *Lieut. Green.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 692 contains a young specimen perhaps belonging to this species, but differing from the rest in having the ligamental groove closed, and the scaly processes larger and more spathulate: *long.* 2·3.

Tablet 693 contains a very young, highly coloured valve, ·22 across.

Tablet 694 contains a young sp. from Pinna, with Ostreæ, Vermetidæ, &c. attached: *long.* 4·.

Tablet 695 contains a finely grown adult sp., with Vermetidæ, Chama &c. attached.

Tablet 696 contains a sp. presented by F. Bacon, Esq., displaying the interior. The outside contains burrows of Parapholas calva, Gastrochæna ovata and truncata, Lithophagus aristatus and plumula, &c. Two Pholads remain in situ, having forced themselves against the interior of the shell.

Tablet 697 contains a fragment of an attached valve, 2·5 in. thick, with numerous burrows, displaying the white marble-like interior portion, and the coloured exterior bored by worms.—698, 2 fragments displaying the colour layers.—699, a fragment exhibiting the orange red colour.

209. ? SPONDYLUS ———, *sp. ind.*

Tablet 700 contains a fragment with very large flattened tubercular knobs.

Hab.—Mazatlan; in Chama washings; *L'pool Col.*

GENUS PLICATULA, *Lam.*

210. PLICATULA PENICILLATA, *n. s.*

P. t. albâ, brunneo sæpe tenue penicillatâ, elongatâ, haud valde costatâ, margine plerumque plicatâ; dentibus cardinalibus elongatis, rugosis, externis magnis valde extantibus; internis angustis, ligamentum minimum tubulatum amplectentibus; cicatrice musculari subcirculari seu subovali.

Plicatula dubia, var., *Sow.* ms. in Mus. Cuming.

A small specimen in Mr. Cuming's collection did not present sufficiently marked characters, in the judgment of Mr. Sowerby,

to separate it from the aberrant species from Ld. Hood's Island. The Mazatlan specimens are however distinct both in colour and habit of growth. A very young valve ·15 across is not plicated: a larger flat specimen on Crepidula is ribbed, but scarcely plaited at the margin: a still larger one is but very indistinctly ribbed. A swollen, short specimen, grown on a spine of Murex nigritus, is rather strongly plicated; while the largest, in Mr. Darbishire's collection, grown between two folds of Chama, scarcely displays crenations, except near the hinge. The finest grown specimen displays the following characters: margin scarcely plicate, internally finely crenated on each side of the hinge; a deep hollow in each valve running up inside the umbos: central teeth (on the attached valve) joined together for more than half their height, holding the ligament, which is extremely small, tubular, only exposed at the extremities, and running up to the umbos, though not exposed (or scarcely covered) as in Spondylus, but nearer the interior of the shell. In the free valve, the ligamental tube rises up, separating the pits of the inner teeth. In this specimen the muscular scar is almost round; in another, rather oval. The valves are held together by the interlocking of the large rugose teeth. No other species is described from the West American coast. Mr. Darbishire's specimen measures, *long.* 1·2, *lat.* ·6, *alt.* ·38.

Hab.—Bay of Fonseca, *Cuming.*—Mazatlan; extremely rare, on shells; *L'pool Col.*

Tablet 701 contains the pair off Murex nigritus; the young flat valve; and the finest specimen, off Crepidula aculeata, (white var.)

Family OSTREIDÆ.

Genus OSTREA, *Linn.*

The usual discriminating marks between species are of little value in this genus. Neither the shape, amount of adherence, sculpture, character of the hinge, colour, direction of the umbos, denticulation or plication of the margin, nor even the shape of the muscular impression, afford unvarying characters. Geographical distribution also is not of much help, the same forms appearing in widely distant seas. The study of the young shells does not, as it is wont, bring fresh light; very widely separated forms being scarcely distinguishable in early

stages. The prismatic external layer, in rather large cells, is often beautifully apparent at this period. The naturalist has to rely on a balance of characters and the general habit of growth; and even in these is liable to great error, unless he judge from a comparison of large series of specimens. Those from Mazatlan were numerous enough to confuse, not to help; and therefore the following descriptions will need verification.

211. OSTREA IRIDESCENS, *Gray*.

Gray, ms. B. M.—*Hanl. Conch. Misc.* Ostrea, pl. 2, f. 6, 7.
Ostrea sp. ind. *b*, *C. B. Ad. Pan. Shells*, p. 245, no. 381.
Compare O. prismatica, *Gray*, *Ann. Phil.* vol. xxv. 1825.
Comp. O. spathulata, *Lam. An. s. Vert.* vol. vii. p. 225, no. 16.
Comp. jun. O. margaritacea, *Lam.* loc. cit. p. 228, no. 26.
Comp. jun. O. Æquatorialis, *D'Orb. B. M. Cat. Moll.* p. 88, no. 776:—? + (teste *Gray*) O. Puelchana, *D'Orb.* loc. cit. p. 87, no. 775.
Jun. ? = Ostrea rufa (pars), *Gould* ms. (California.)

As it is very doubtful whether the Mazatlan shells belong to either of the imperfectly characterized Lamarckian species, and as they certainly belong to the O. iridescens of Gray, just published by Hanley, I have adopted the latter name. It is recognized pretty distinctly (for an oyster) by its prolonged rectangular shape, long square hinge, laminated not undulated structure, and above all by the brilliant nacre, and rich brownish-purple, metallic lustre of the interior. A few flattened knobs appear on each side of the hinge in one valve, fitting into corresponding depressions in the other. Muscular scar large, reniform, variable. This shell has long been known from a large series of very fine African specimens in the Bristol Museum, now, alas, for the most part lost. A valve which came into my possession in the year 1836 contained abundance of Lithophagus aristatus, and 2 valves of Placunanomia pernoides: I believe also that valves of Petricola robusta were out of the same oysters, as there was at that time scarcely a single West Coast shell in that Museum; but of this I am not certain. On finding the same Oyster and the same Placunanomia, along with the same Lithophagus, in the Mazatlan collection, I sought for further confirmation of so singular a fact in geographical distribution. I therefore not only referred to the Bristol Mus. Cat., in which the locality was entered as "West Africa" in Mr. S. Stutchbury's own hand; the employés at the Institution bearing testimony to the same fact;

but I disentombed the remaining valves, carefully collected the dirt from them, and examined their surfaces. I found 2 perfect specimens of Pl. pernoides, and many of Lith. aristatus, as well as some red coral on the valves; and among the dirt 2 (well known African) species of Cardita, 2 of Arca, 3 of Odostomia, a Chemnitzia, Fissurella, Margarita, Purpura and some fragments, none of them occurring on the Mazatlan coast, as well as Kellia suborbicularis, which is supposed to be common to both seas. The locality is further confirmed by the constant trade from Bristol to the Senegambia coast, while there was none (at that time) to West America. Of the specimens in the British Mus., one is from Anamaboa, an island in the W. African seas; it contains Lith. aristatus, Vermetus glomeratus, and two young specimens of Placunanomia which agree with Pl. pernoides in all respects except that the colour is lighter. This is probably from youth and want of light, as I discovered them at the bottom of a Lithophagus burrow, tightly wedged. The other specimen from an unknown locality, (? Australia, *Gray*) appears to be from the same seas, from its having the same Lith. aristatus, the same Vermetus, 2 attached valves of the same Placunanomia, as well as a young Hipponyx (not W. Coast Am.), Saxicava ? arctica, and a dead Lucina too imperfect for identification.

The Mazatlan shells appear when young to be destitute of denticles. Though normally very distinct from O. Virginica, yet they sometimes approach it in form, developing a very long and waved ligament area, which is then somewhat hollowed out inside, though never so much as in O. Virginica. The smallest valve identified measures ·18: the largest, (which being from an unknown locality, though probably from Mazatlan, I have not ventured to include in this collection,) is of regular growth, adherent all over to a very flat surface, and measures *long.* 9·25, *lat.* 6·3, *alt.* 2·07. My African valve which is of more normal shape, measures *long.* 8·3, *lat.* 4·2. A very broad specimen measures *long.* 4·2, *lat.* 4·3. A curiously distorted one measures *long* 6·5, *lat.* 2·8; of the length almost (when perfect, quite) one half consists of hinge area, in laminated chambers!

Hab.—Panama; attached to ledges of rock by the greater part of the lower valve, near half tide level, not common; *C. B. Adams.*—West Coast America, *Hinds.*—Guacomayo; on rocks at low water; *Cuming.*—Mazatlan; very rare; *L'pool & Havre Coll.*—W. coast Africa; *v. supra.*

Tablet 702 contains 4 young valves, side denticles not developed.—703, an adult specimen, normal shape.—704, do. very transverse.—705, do. with very elongated hinge, (from the Havre Col.) kindly presented by S. Hanley, Esq.

212. OSTREA VIRGINICA, *Gmel.*

Gmel. p. 3336, no. 113, teste *Dillw.* and *Wood.*—*Dillw. Descr. Cat.* p. 277.—*Wood. Ind. Test.* p. 52, no. 68.—*Lam. An. s. Vert.* vol. vii. p. 225. no. 18.—*Conr.* in *Journ. Nat. Sc. Phil.* 1829, p. 212, 216.—*Sow. Gen.* f. 2.

Ostrea Virginiana, *Gmel.* teste *Lam.* loc. cit. et *Gould Inv. Mass.*

Ostrea rostrata maxima, *Chemn. Conch. Cab.* vol. viii. p. 38, pl. 73, f. 677.

Ostrea elongata, *Soland.* ms.:—*Portl. Cat.* p. 55.

Sen. = Ostrea crassa, *Chemn.* loc. cit. p. 40, pl. 74, f. 678.

Jun. = Gryphæa angulata, *Lam.* loc. cit. p. 203, no. 1., teste *Sir W. C. Trevelyan* in B. M., non auct.

+ Ostrea Canadensis, *Lam.* loc. cit. p. 226, no. 19, teste *Desh.*

? + Ostrea longirostris, *Lam.* loc. cit. p. 243, no. 17, teste *Trevelyan;* sed v. *Desh.* in loc.

? Ostrea sp. ind. *d. C. B. Ad. Pan. Shells,* p. 246, no. 383.

Jun. ? = Ostrea rufa (pars), *Gould.* ms. (California.)

As the few specimens of this shell sent in the Mazatlan collection do not offer any marks by which they can be distinguished from the Atlantic O. Virginica, I have followed Mr. Hanley in referring them to that very variable species. So like are they, that I have unfortunately distributed many specimens in Mazatlan collections, received from a trustworthy dealer as from there, which the detection of an entombed Mytilus, known to be a W. Indian and not a Pacific species, has proved to have come from the Atlantic waters, probably from Honduras. These differ from the authenticated Mazatlan specimens in being generally straighter, shorter, thick, with the muscular impression more deeply coloured and lower down: but these characters are not constant in either series. C. B. Adams remarks of his Ostrea *d*, which usually occurs in clusters, that the flavour is superior to that of O. Virginica or O. borealis: but the same may be said on comparing varieties of O. edulis with each other. The O. Virginica is thus described by Gould. "Shell elongated, narrow; beaks pointed, not much curved; ligamentary eminence of the upper valve extending back to the apex. This is the common oyster of the Chesapeake

Bay: occasionally found near Boston, and also at Prince Edward's Isl., St. Lawrence": (?=O. Canadensis, *Lam.**) Conrad quotes it as fossil in Maryland and as common to the U. States and Europe recent: "Found at Nissau, between Narbonne and Beziers in France, teste Brongniart." A similar shell is in the Br. Mus. from Africa. Another specimen, from the mouth of the Tagus, with a fossil from Lisbon, are marked O. longirostris, *Lam.* They are considered a var. of O. Virginica by Sir W. C. Trevelyan, who also states that the young is the Gryphæa angulata of *Lam.* The type specimen of the latter in the Br. Mus, and the young specimens from Mazatlan, appear to me, though not to more experienced naturalists, to confirm this opinion. The species is also from the Portugal Coast in the Bristol Mus.; and specimens which appear exactly like those from ? Honduras are in the Br. Mus. from China, on the authority of Tradescant Lay, Esq. The form is also from Australia; Mus. Cuming. The Mazatlan shells when adult are generally rather incurved, thin, with the attached valve convex, foliated, and undulated with very indistinct radiating furrows, which do not appear at all on the flat upper valve. Cartilage area in the lower valve long, deeply undulated, generally pointing to the left, sometimes to the right, or straight. Attachment sometimes only to a stick, sometimes to shells by a large part of the surface. When young, sometimes shaped like the adult, sometimes very broad and spreading beyond the inner margin, as though in search of a firm foundation for future prolongation. The umbo is then often subspiral. In this state it may be generally distinguished from neighbouring species by the rich sub-nacreous orange and violet colouring, and absence of crenations near the hinge. Sometimes however it is nearly white, as it generally is when adult. The muscular scar is generally kidney-shaped, but varies in almost every specimen according to the breadth or prolongation. The hinge area is generally hollowed beneath. The youngest identified specimen is ·93 long, of which ·16 is spiral ligament-area; another, not so long within, has a straight area measuring ·34. The largest specimen in Mr. Darbishire's collection, measures *long.* 9·5, *lat.* 2·1.

Hab.—Bay of Guayaquil; in brackish water on mud banks; *Cuming.*—Mazatlan; very rare; *L'pool & Havre Coll.*—[For localities in other seas, and fossil, *v. supra.*]

* Lamarck's O. Virginica is characterized by a violet stain on the muscular impression; but Desh. states that the specimens ticketed in his own hand writing have the impression white, while in his O. Canadensis it is violet.

Tablet 706 contains a young valve, ·63 long, and a larger pair, broad spreading form, hinge straight.—707, 1 do. hinge spiral.—708, 3 pairs and a valve, different ages, forms and colours.—709, Arca grandis, with valves of O. Virginica attached.—710, an adult sp. attached to a twig, with another valve, 4·5 long, attached to it by its whole length.—Another of intermediate size will be found on tablet 20; and a valve with Crucibulum.

Tablet 711 contains a very small Gryphæa-shaped shell, with spiral umbos, ·11 in length, which is probably the young of this species.

213. OSTREA COLUMBIENSIS, *Hanl.*

Proc. Zool. Soc. 1845, p. 107 :—non Ostrea sp. ind. *c*, *C. B. Ad. Pan. Shells*, p. 246, no. 382.

Shell inside without denticles, of a pure white, resembling a small O. edulis; hinge area very small. Outside smooth, or with laminæ of growth; light ash, with numerous narrow rays of purple. Rather thin, flat, attached by the whole surface. The largest valve (abnormally produced) measures *long.* 1·55, *lat.* 1·24.

Hab.—St. Elena; adhering to rocks at half-tide; *Cuming.*—Mazatlan; on shells and barnacle-covered rocks, very rare; *L'pool Col.*—Lower California, on Arca grandis, Gould's Col.

Tablet 712 contains a very young pair, detached, and a valve on Imperator unguis.—713, 2 upper valves.—714, 2 pairs, very flat and under valve spreading, probably belonging to this species, though approaching some forms of O. Virginica, jun.

214. OSTREA CONCHAPHILA, *n. s.*

O. t. plerumque parvâ, tenui, subovali, testis variis affixâ; purpureâ, sæpe aurantiâ tinctâ, interdum radiis unâ vel duabus; cardine parvo, utroque latere denticulis crenato; areâ ligamenti angustâ, triangulari, sæpius sulco denticulato utrâque parte extus ornatâ; plerumque totâ valvâ affixâ, margine integro, sed interdum subiter ascendente, margine undato, vix plicato; intus subnacreo; cicatrice modico, irregulari.

? = Ostrea sp. ind. *c*, *C. B. Ad. Pan. Shells*, p. 246, no. 382.

Shell, when delicately grown among Pinnæ and Anomiæ, closely resembling O. bicolor, *Hanl. (Proc. Zool. Soc.* 1845, p. 107 :—*Conch. Misc.* pl. 1, f. 2; supposed to be from West

Africa;) from which it is known by the minute denticles on each side of the hinge. One valve, of a rich orange within, has a deep purple streak outside gradually shading off into the most delicate penciling, and another faint ray of clouded purple, leaving two orange areas; the purple bordering the inner margin, and shading most exquisitely into the orange. Oysters are rarely seen of such surpassing beauty. Ordinarily it is a very small purple shell, frequenting other shells even when living, and often interfering with their growth. It is known by the very small triangular ligament area, with very fine denticles on each side. In addition to these, there are generally (in the attached valve) two lines of denticles situated in furrows running outside the area to the umbos. It begins life as a swollen regularly formed body, of the shape of Astarte compressa. A specimen from S. W. Mexico, in a dead Cypræa, retains this regularity and general form: it is smooth, white, and convex. The hinge of the attached valve, when extremely young, reminds one of Mesodesma; the ligament being internal between two raised processes followed by pits; the processes afterwards developing into the ligamental area. Sometimes the shell becomes rather thick, and, after continuing smooth and flat, suddenly rises, and waves (almost plicating) the outer margin. The young of the stronger shells being brilliant in colour, might easily be taken for those of O. iridescens: if however, (as I have supposed from the valves already quoted) the young of that shell is not crenated, the denticles afford a good distinguishing character; and, at a later period, the crenated sulci round the area. I have specimens received as from W. Africa, at any rate inhabiting an Atlantic Pinna, which present the same colouring, habit of growth, and somewhat remarkable hinge. They seem from the crenations not to be the young of O. bicolor. The finest grown specimen measures *long.* 1·04, *lat.* ·94, *alt.* ·12.

Hab.—Mazatlan; not uncommon, on various shells, v. infra; *L'pool Col.*—S. W. Mexico, do., *P. P. C.*—? Panama, attached to stones, rocks and shells, near half-tide level, *C. B. Adams.*—San Diego, very fine; *Lieut. Green.*—San. Diego and Oregon; *Nuttall.*—? W. Africa, in dead Pinna rudis, *P. P. C.*

Tablet 715 contains 1 pair and 7 valves, extremely young, the smallest ·04 across, chiefly from Chamæ and Spondyli.—716, a sp. of Anomia lampe, with extremely young oysters in situ.—717, 4 valves, a stage older.—718, a young sp. opened,

on Anomia lampe, shewing the hinge.—719, 3 valves approaching O. iridescens.—720. 3 do. purple, one with the form of Modulus to which it had attached itself.—721, 5 do. orange tinted.—722, 3 do. stronger texture.—723, very young specimens on Anomia lampe, with Vermiliæ, &c.—724, do. on Crepidula and Imperator.—725, a very regular valve on Conus regularis.—726, a pair and valve on living Modulus. The latter must have been greatly in the way of the creature when it walked out: on coming to the extremity of the shell, it has turned up and waved its margin.—727, a very smooth sp. inside Trochus versicolor.—728, 2 finely grown large valves.—729, 2 pairs and valves on Murex nigritus, jun., margin turned up and waved.—730, a pair (and valves) on Arca tuberculosa; margin of both upper and lower valve very suddenly turned up and waved.

Tablet 731 contains 6 valves, solid white variety, known from O. Columbiensis by the crenations.—732, valve on Vitularia salebrosa.—733, crowded valves on Arca tuberculosa. N. B. Dead valves, common on this shell, assume an ochre yellow colour.—734, valve on living Modulus, with deep hinge cavity.

214, *b*. OSTREA ?? CONCHAPHILA, *var.* PALMULA.

O. ?? conchaphila, t. satis magnâ, margine subito ascendente, valvâ inferiore superante, undulato, limbo purpureo seu olivaceo irregulariter tessellato; lineâ pustularum valvâ superiore, in parte nacreâ, a margine remotâ, circumeunte, in puncta convenientia valvâ inferiore aptante; paginâ internâ subnacreâ, aurantio seu purpureo tinctâ; rarissime spinis ramosis paucis, tubulis ad marginem exteriorem arborescentibus.

Compare Ostrea Cumingiana, *Dkr. Zeit. f. Mal.* 1846, p. 48. (Patria ignota.)

Remarkable for the palmated foliations in the outer margin, which has a distinct limb mottled with purple and olive; and for the row of denticles within this limb and within the nacreous border, fitting into corresponding depressions in the other valve. As these seem to appear only in the adult shell, it is barely possible that O. conchaphila may occasionally develop itself into this form. Mr. Nuttall however agrees with me in regarding them as distinct. *Long.* 2·3, *lat.* 1·6, *alt.* ·54.

Hab.—Mazatlan; extremely rare; *L'pool Col.*—S. W. Mexico, *P. P. C.*—Upper California, *Nuttall.*

Tablet 735 contains a young elongated specimen.—736, another, rounded form, with a few tubular spines near the margin of the upper valve.—737, the largest sp. with Vermetidæ, &c.

215. OSTREA ———, *sp. ind.*

?=Ostrea sp. ind. *c, C. B. Ad. Pan. Shells*, p. 246, no. 384. Ostrea iridescens, jun. *P. P. C. Cat. Prov.*

Agreeing with O. iridescens in its square form, straight hinge, and nacreous interior; differing in the irregular radiation of the lower valve, and strong sharp plication of the margin. This differs from the undulated margin of O. c. palmula, in not having a distinct limb, with remote line of denticles. These, if present, are very small, and rather near the margin. The characters are so variable that I should have continued to regard this as the young of O. iridescens, but for finding specimens of the latter without hinge denticles, which in these shells are strongly marked; and for the remark of Prof. Adams, with regard to what appears the same species, that the animal has a bitter flavour. *Long.* 2·5, *lat.* 2·5, *alt.* 1·35.

Hab.—Mazatlan; very rare, on shells; *L'pool Col.*—? Panama; very common, attached to rocks and stones from one to three-quarters tide level: small var. on Nerita scabricosta; *C. B. Adams.*—San Diego, *Lieut. Green.*

Tablet 738 contains 7 very young valves, off Spondyli and Chamæ.—739, 1 do. on Imperator olivaceus.—740, 1 do. on Imp. unguis, distorting the shell.—741, 1 young white valve, resembling O. Virginica, but with crenated hinge.—742, 2 valves approaching O. iridescens.—743, 4 pairs strongly plicate, green within.—744, 1 large pair, attached by portion of the valve to Pinna.

FAMILY ANOMIADÆ.

GENUS PLACUNANOMIA, *Brod.*

Brod. in *Proc. Zool. Soc.* 1832, p. 29.—*Gray* in *B. M. Cat. Anom.* p. 8.
Subgenus Monia, *Gray, Proc. Zool. Soc.* 1849, p. 121.

216. PLACUNANOMIA PERNOIDES, *n. s.*

P. t. formâ maxime variante, interdum transversâ, interdum maxime elongatâ, valvâ inferiori maxime perforatâ, cuneo intus liris haud tenuibus instructo, fulcro ligamenti valde extante,

spathuloso : valvâ superiori musc. cicatr. duabus, quarum una magna, centralis, radiatim tenuissime striata ; alter haud parva, alteri attingens ; lineâ pallii perdistinctâ unam alteramque amplectente ; colore atropurpureo, seu atrofusco, subnacreo, splendente ; extus interdum radiatim tenuissimè striatâ ; umbone a margine subdistante.

Comp. Tedinia pernoides, *Gray, Proc. Zool. Soc.* 1851, p. 197-8. Jun.=Anomia, sp. 3. *P. P. C. Cat. Prov.*

This shell has long been known to me from two attached valves on an African specimen of Ostrea iridescens ; v. supra : but not being aware that it was undescribed, Dr. W. B. Carpenter destroyed one of them for examination into the shell structure. On finding the same species on Chama at Mazatlan, and comparing it with the types in the B. M. and Mr. Cuming's Collection, it appeared new, differing from all described species in colour, which is peculiarly dark and lustrous. On the Mazatlan Chamæ and Spondyli were found the specimens below enumerated, also a small ovate valve, and a beautiful pair in the collection of Mr. Darbishire. On the African oysters in the British and Bristol Museums I also found specimens as above stated. Mr. Archer has in his collection a magnificent upper valve, measuring 2·0 by 2·4 in., which he found among the rubbish from a ship laden with pearl oysters from Panama : all the other shells from the same rubbish were known to be from that coast. The Tedinia pernoides of Gray, described from an extremely distorted specimen in Mr. Cuming's Collection, is so very like this shell in its leading characters that I am strongly of opinion that they are identical. Mr. Woodward, who had not felt sufficient confidence in Dr. Gray's genus to admit it into his Manual, examined the shell with me, and we were both doubtful whether the supposed additional muscular scar near the hinge was more than a peculiarity of growth. There were so many lines traceable on the inner surface that a naturalist so disposed might have arranged almost as many muscles as he thought desirable. The point must await the arrival of fresh specimens. To provide for the case of my suspicions being correct, I have given the same specific name to this which is a veritable Placunanomia. The structure of the inner surface of the plug, which is large and coarse, does not appear horny under the microscope ; but composed of parallel shelly plates with much animal matter interlying. The largest Mazatlan specimen

measures *long.* 1·34, *lat.* 1·82, *alt.* ·36: an elongated valve from the hole of a Lithodomus, *long.* 1·52, *lat.* ·6.

Hab.—West Coast of Africa on Ostrea iridescens, *Stutchbury.*—Mazatlan; extremely rare, on Chamæ and Spondyli; *L'pool Col.*—Panama, among pearl oysters; F. Archer.

Tablet 745 contains a young perfect pair, both valves detached, with hole like Anomia.—746, a broken attached valve, shewing the hinge and portions of the plug.—747, the elongated valve.—748, the largest pair, detached, nearly perfect.

217. PLACUNANOMIA FOLIATA, *Brod.*

Brod. in *Proc. Zool. Soc.* 1834, p. 2.—*Gray* in *Proc. Zool. Soc.* 1849, p. 121:—*B. M. Cat. Anom.* p. 10.—*B. M. Cat. D'Orb. Moll.* p. 88, no. 778.

+ P. echinata, *Brod.* loc. cit., teste Gray.

+ "P. pectinata, *Brod.*" in Mus. Cuming, teste Gray.

Subgenus Pododesmus, *Phil.*, *Gray* in *B. M. Cat. Anom.* loc. cit.

Only two young and transparent valves were found of this species. White, with central brown stain; outside with prickly longitudinal striæ. They seem to agree with a very characteristic valve found in the S. W. Mexican collection. *Long.* ·75, *lat.* ·57.

Hab.—Guayaquil Bay; on dead Pinna in sandy mud, 11 fm.; *Cuming.*—Ecuador, Guayaquil, *D'Orbigny.*—Isle of Muerte, Broderip.—Martinique, no. 6, and Brazils, no. 7; Mus. Cuming.—St. Vincent and Jamaica, *Rev. L. Guilding* in B. M.—S. W. Mexico *P. P. C.*—Mazatlan; 2 valves in Spondylus calcifer; *L'pool Col.*

Tablet 749 contains the larger valve and fragments.

218. PLACUNANOMIA CLAVICULATA, *n. s.*

P. t. suborbiculari, tenuissimâ, planatâ, lævi, seu striis incrementi exillimis: albâ, maculâ brunneâ discam candidam pyriformem haud distinctam circumeunte; valvâ inferiori hyalinâ, perforatione magnâ, fulchro V*-formi: lamellâ albâ acutâ prope perforationem intus decurrente: valvâ superiore musc. cicatr. majore subovali, minore rotundatâ, modice separatâ.*

Subgenus Monia, *Gray*, loc. cit.

Anomia, sp. 2, *P. P. C., Cat. Prov.*

It is so easy in thin Anomiadæ to see the muscular scars one expects, that I had sketched 3 scars for this species to shew the difference in arrangement from those of A. lampe, of which many conchologists had considered my valve a variety. Having however found a pair, and being struck by the V-shaped notch at the cardinal end of the hole, I re-examined the scars, and found the supposed third to be only one of those non-muscular impressions which are very liable to deceive beginners till they have learnt from books what they ought to look for. Shell extremely like Anomia lampe (smooth var.); from which it is known at once by the brown disk, inside which is a very faint white disk, with the extremity rounded, not triangular. It is known from P. foliata by the entire absence of radiating striæ, which are very conspicuous in young shells of that species. A remarkable feature in this shell is the sharp white lamina, (or clavicle,) which runs from the hinge in the lower valve, near the hole but not parallel with it, losing itself in a thin white deposit in which is the muscular scar. This clavicle, or lengthened support to the cartilage plate, is also seen in P. Cumingii, large, rounded, and running in a straight line to the muscular scar. It is more or less developed in some other species of the genus; but is remarkable in this for its length, direction and sharpness. *Long.* 1·12, *lat.* 1·46, *alt.* ·16.

Hab.—Mazatlan; one pair and a valve with Anomiæ; *L'pool Col.*

Tablet 750 contains the pair.

Genus ANOMIA, *Linn.*

219. Anomia lampe, *Gray.*

Proc. Zool. Soc. 1849, p. 117;—*B. M. Cat. Anom.* p. 19, sp. 14.—*C. B. Ad. Pan. Shells*, p. 244, no. 377.

This shell in its ordinary state would hardly be known by the meagre description in the B. M. Cat.; but the very numerous finely grown specimens sent in this collection give opportunity to record its leading features. Many hundreds were sent carefully packed; but most have been broken since they came to this country. There was also a box of valves, many of them extremely brilliant, from which I picked the valve of P. claviculata; doubtless there were many other treasures in it, but it was unfortunately sold off to make ladies' fancy work before I had an opportunity of examining it.

Shell extremely thin; lower valve white, smooth; upper whitish, more or less stained with golden yellow, rarely salmon coloured, extremely rarely greenish, most rarely with a slight touch of pink; smooth, generally developing irregular radiating ribs near the margin, sometimes strong ones all over. Occasionally concentric waves of growth are developed. Lower valve dead white within near the somewhat large (sometimes small) hole, gradually becoming transparent; upper valve with a defined white spathula, somewhat in the shape of an isosceles triangle with an excurved base, radiating from the light green ligament, and enclosing the scars. The plug scar is not much larger than the others, and is rounded subquadrate. The others are round, slightly separated, and at a variable angle according to the shape and age of the shell. In different specimens examined, the lines joining the centres of the terminal scars with the centre of the middle one, are inclined at angles varying from 105°—133°; shewing how necessary it is to be cautious in founding species merely on the position of the scars. If this divergence of central angle were given in descriptions, it would greatly aid the student. The subcardinal scar is small and very slightly impressed. There is a short support from the hinge fulcrum in the lower valve. The plugs, of which a few were fortunately preserved on the outer valves, are very different in appearance from those of A. ephippium; being large and spreading at the base, but short and small in the attached portion. Extremely fine lines run down the raised part to the margin of the base, but the rest of the base is not grooved. As the shell grows older, it appears to increase the raised part near the umbo, withdrawing from the grooved part of the base, which is no longer covered by the hole. The hole is very much larger than the raised part, which fills only the middle of it. One plug has a large tail, like the expanded foot of a Cyclas, from the gradual shifting of the animal. The raised part has generally a horse-shoe extremity, sometimes built up with very loose shelly matter. The plug under the microscope appears essentially shelly, though with much animal matter. Very young shells are generally orbicular, beginning life as an irregular body without prominent apex, shaped like Discina. The smallest valve is ·09 across; the largest specimen measures *long.* 1·9, *lat.* 2·44, *alt.* ·14.

Hab.—California *Lady Wigram*, B. M.—Monterey, 60 fm., *Major Rich.*—La Paz, do.—Panama; at low water mark; 1 sp.: *C. B. Adams.*—Mazatlan: common and very fine; *L'pool Col.*

Tablet 751 contains 4 valves, extremely young.—752, 6 sp. usual state.—753, 2 do. concentric furrows developed.—754, 6 do. radiating ribs strongly developed.—755, 4 sp. finely grown, ribs slightly developed.—756, 3 do. concentric lines marked.—757, 3 do. almost smooth.—758, 2 do. waxen aspect, like Placunanomia claviculata.

Tablet 759 contains 3 sp. bright yellow.—760, 2 do. greenish, ? from Conferva.—761, 2 do. with tinge of pink.

Tablet 762 contains 3 sp. salmon tint, radiated.—763, 1 do. with concentric waves.—764, 1 do. with greenish.—765, 1 do. grown over with Vermiliæ, which indent it throughout.—766, 1 do. square form, with Vermiliæ attached: (a beautiful little species, often found on this and other delicate shells.)—767, 4 lustrous valves, shewing changes in the central angle of scars.

Tablet 768 contains 2 sp. distorted growth, inflated.—769, 3 do. corrugated surface.—770, 3 do. transverse growth.—771, 2 do. indented.—772, 3 do. right side cut off at various angles.—773, 4 do. left side do.—774, 3 do. vertex, distant from margin.—775, 2 do. hole small.—776, 1 do. with remarkable rows of egg cases.

Tablet 777 contains 3 sp. with variously formed plugs attached.—778, a sp. with young attached: both valves are removed, shewing its own plug, and another small one near without corresponding shell.—779, another sp. with young attached; the upper valve only is removed, shewing the lower in situ.—780, 9 pairs and valves shewing interior.

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220. ? ——— ———, *sp. ind.*

Tablet 781 contains a minute valve, (found since the first part of this Catalogue was printed,) of which it is hard to tell even the generic place. The outside has the general appearance of Sphænia fragilis; extremely thin, transparent, covered with a copious epidermis with rather distant concentric layers; very inæquilateral, with an obscure angle from the very projecting umbos to the posterior end. Hinge with two long lamellar teeth, one going posteriorly from the umbo, the other parallel to it, nearer the anterior end. Ligament apparently external, very thin. *Long.* ·05, *lat.* ·027, *alt.* ·007.

Hab.—Mazatlan; one fresh valve off Ostrea iridescens; *L'pool Col.*

CLASS PTEROPODA.

Omnia adhuc ignota.

CLASS GASTEROPODA.

The knowledge of this class of Mollusks has rapidly increased since attention has been paid to their mouths and teeth. The main divisions here adopted are probably well founded. In the smaller sections we do not as yet know enough to stereotype an arrangement. Whatever character be taken as the guide, families are united, unlike in other respects, or separated when many points of structure indicate affinity. The science being in a transition state from the old conchological arrangements, all dogmatism, on any side, is clearly out of place.

Sub-class OPISTHOBRANCHIATA.

Order TECTIBRANCHIATA.

Family CYLICHNIDÆ.

Genus CYLICHNA, *Loven.*

221. Cylichna luticola, *C. B. Ad.*

Bulla (Cylichna) luticola, *C. B. Ad. Pan. Shells*, p. 215, no. 320: do. p. 319.

Hamimea luticola, *H. & A. Ad. Gen.* vol. ii. p. 16.

Shell remarkably constricted in the middle, swelling anteriorly. The surface is extremely finely decussated between the well-marked striæ of growth. *Long.* 1, *lat.* 04.

Hab.—Panama; crawling on liquid mud, near low water mark, at the bottom of a steep sand beach, rare; *C. B. Adams.*—Mazatlan; 2 dead specimens off Chama; *L'pool Col.*

Tablet 782 contains a characteristic specimen.

Genus TORNATINA, *A. Adams.*

Distinguished from Cylichna, *Loven*, by the head being developed behind into tentacular lobes. Shell with the spire distinct. Columella with a spiral plait.

222. Tornatina infrequens, *C. B. Ad.*

Bulla (Tornatina) infrequens, *C. B. Ad. Pan. Shells*, p. 214, no. 319; do. p. 319.

β = Bulla (Tornatina) gracilis, *Mke.* (non *A. Ad.*) *Zeit. f. Mal.* 1850, p. 162, no. 3.

Menke's species being white, not horn-coloured like T. gracilis from the China Seas, and being identified from a single specimen wedged in the mouth of a dead Conus puncticulatus, is almost certainly the same as that described by *C. B. Ad.* from Panama. T. infrequens is distinguished by the Oliva-like spire, more or less elevated and deeply channeled along the suture. The body whirl is not swollen anteriorly, and the fold lies slanting on its base. *Long.* ·14, *long. spir.* ·03. *lat.* ·05, *Hab.*—Panama; extremely rare; *C. B. Adams.*—Mazatlan; very rare, on Spondylus calcifer; *L'pool Col.*

Tablet 783 contains the finest specimen; and the smallest measuring, ·07 in length.

223. Tornatina carinata, *n. s.*

T. t. cylindraceâ, albâ, lævi, infra suturam appressam acute carinatâ; inter suturam et carinam excavatâ; anfr. v. *quarum duo primi discoidales, ad spiram verticaliter affixi; spirâ plus minusve extante; aperturâ prælongâ, labro acuto, in medio producto, postice ad suturam vix canaliculato; labro tenui; pariete ad basin tumidâ; columellâ plicâ infra parietem robustâ spiraliter munitâ.*

Known from T. infrequens (1) by the smaller size, and more irregular spire; (2) by the suture, which is not channeled; (3) by the shoulder, which is sharply carinated, with the space hollowed between the keel and suture; (4) by the swelling of the body whirl at the base; and (5) by the plait which runs more transversely, below the body whirl, instead of obliquely, almost on it, as in T. infrequens. By some of the above characters it is further distinguished from T. cerealis, *Gld. (Mex. &*

Cal. Shells, p. 5, Sta Barbara, *Jewett,)* which resembles T. infrequens much more closely than this species. All the three forms begin life as a small discoidal body, like a tumid Planorbis. After making about two turns of this, they proceed in the regular way, affixing the disk vertically, or sometimes in a slanting direction, at the top of the spire. The length of spire in this species, which is not so rare as T. infrequens, is extremely variable. The smallest specimen is ·037 long. The largest measures *long.* 11, *long. spir.* ·02, *lat.* ·05. The discoidal apex is ·005 across.

Hab. — Mazatlan; on Chama and Spondylus, very rare; *L'pool Col.*

Tablet 784 contains 5 sp. varying in age and shape, and a fragment to shew the apex.

Family BULLIDÆ.

Genus BULLA, *Klein.*

224. Bulla Adamsi, *Mke.*

Zeit. f. Mal. 1850, p. 162, no. 1. (syn. excl.)

Dr. Menke regards this shell as that figured in *Sow. Thes. Conch.* f. 64, 65, under the name of B. australis. In this he is probably mistaken, but not in regarding the species as distinct both from that and from B. Panamensis, *Phil.* It greatly resembles B. media, *Phil.* and still more B. major, *Phil.*, both from the West Indies. It differs from the Upper Californian B. nebulosa, when adult, in being much smaller, more solid and contracted, and in having a much larger umbilicus. Shell chocolate coloured, very variously dotted with white, shadowed off in dark. Lip at the base strongly reflected, in the young shell distinct from the labium, which is well marked, white. Apex deeply umbilicate, shewing the whirls and with the inside spirally striated. The whole surface (described by *Menke* as smooth) is covered with extremely fine spiral microscopic striæ, irregular, sometimes broken into dots by the striæ of growth. Epidermis horny, thin. *Long.* 1·38, *lat.* ·91.

Hab.—Mazatlan, Menke.—Do.: not common; *L'pool Col.*

Tablet 785 contains 3 specimens approaching B. nebulosa in texture.—786, 2 do. normal form.—787, 2 do. more tumid, strong.

225. BULLA ?NEBULOSA, *Gould.*

U. S. Expl. Exp. Moll.—Mke. in *Zeit. f. Mal.* 1850, p. 162, no. 2.

A very few thin, subglobose shells were found, with a small umbilicus, which are undistinguishable from the young of B. nebulosa; a species which, along with other points of similarity, shews the spirally striate umbilicus, and traces (though faint) of the rugosely striulate surface, of B. Adamsi. B. nebulosa is quoted from Guaymas, and may be one of the very few Californian species which cross the Gulf. I strongly suspect however that these are but aberrant forms of the young B. Adamsi; which varies not a little in outline, solidity, and size of umbilicus. The adult shells are sufficiently distinct. *Long.* 1·, *lat.* ·7.

Hab.—Sta. Barbara, *Nuttall.*—San Diego, *Lieut. Green.*—Guaymas; in sand, 12 in.; Mus. Cuming.—Mazatlan; Menke. —?Do. jun. extremely rare; *L'pool Col.*

Tablet 788 contains the most characteristic specimen.

226. BULLA ?QUOYII, *Gray.*

Sow. Thes. Conch. sp. 48, pl. 173, f. 71.

A very few small specimens were found, differing from B. Adamsi in the following points. Surface much more strongly and closely striulate; outline flattened towards the umbilicus, at an angle of about 60°. Umbilicus strongly striate, bounded by a blunt angle. *Long.* ·5, *lat.* ·3.

Hab.—Gallapagos, *Cuming.*—? Mazatlan; extremely rare: *L'pool Col.*

Tablet 789 contains 3 minute sp., probably belonging to this species.—790, the ? adult specimen.

227. BULLA EXARATA, *n. s.*

B. t. parvâ, elliptică, compressâ, aperturâ elongatâ, angustâ; fuscâ, epidermide tenui cinctâ; spiraliter tenuissime exaratâ, lineis plus minusve distantibus, in medio plerumque evanidis; spirâ haud alte umbilicatâ, intus striulis transversis divaricatâ; labro postice producto; labio columellam versus rimulam umbilicalem simulante.

Distinguished by the acuminated form, fine, rather distant spiral grooves, narrow produced aperture, and slight umbilical chink formed by a fold of the labium. The small spiral umbili-

cus appears slightly denticulate within, from the striæ of growth being there well marked. The labrum extends ·005 beyond the spire. *Long.* ·125, *lat.* ·055.

Hab.—Mazatlan; 2 sp. on Spondylus calcifer; *L'pool Col.*

Tablet 791 contains the larger specimen, slightly imperfect.

228. Bulla ———, *sp. ind.*

Tablet 792 contains a small fragment, remarkable for the sharp angle round the spiral umbilicus. This is furnished within with spiral grooves so strongly marked as to cause the produced labrum to be serrated on the outer side at its junction with the body whirl.

Hab.—Mazatlan; on Spondylus calcifer; *L'pool Col.*

Genus HAMINEA, *Leach.*

Bulla (pars) *auct.* Shell horny, elastic, colourless, semi-interna.

229. Haminea cymbiformis, *n. s.*

H. t. tenuissimâ, albidâ, axi contortâ, maxime inflatâ, spirâ minore, celatâ; aperturâ antice ventricosâ, postice productâ; striulis spiralibus creberrimis ornatâ, rugis incrementi subextantibus; labio tenuissimo.

Only one rather imperfect specimen was found of this beautiful species, which resembles in form a small inflated Cymbium. *Long.* ·07, *lat.* ·05.

Hab.—Mazatlan; 1 sp. on Spondylus calcifer; *L'pool Col.*

Tablet 793 contains the specimen.

Sub-class PULMONATA.

Order GEOPHILA.

Family TESTACELLIDÆ.

Gray in *B. M. Cat. Pulm.* p. 9.

Genus GLANDINA, *Schum.*

Essai Syst. p. 202, 1817.
Oleacina, *Bolten, Mus.* (1798); ed. 2, 1819, p. 77.
Cochlicopa *a, Férus. Tab. Syst.* 1821.
Achatina, pars, *auct.*

Dr. Gray unites Oleacina, Glandina and Halia under the former name, (*B. M. Cat. Pulm.* p. 13;) H & A. Adams consider them distinct: *Gen.* vol. ii. p. 107. Ordinary students have no power of ascertaining whether generic names given with an early date are accompanied by a diagnosis, and therefore of authority, or whether they are only names which have been attached to certain species, and not entitled to take precedence of a regularly defined genus.—The animal of Glandina is said to be carnivorous, and to resemble Testacellus with the spiral part developed.

230. GLANDINA ALBERSI, *Pfr.*

Achatina Albersi (Glandina) *Pfeif.* in *Proc. Zool. Soc.* 1854, p. 295.

A very few specimens of this unpretending species were found among the Physæ. It appears to take the place of G. rosea, found lower down the peninsula. The shape is extremely variable, being sometimes elongated like G. turris; sometimes very much swollen, with a short spire. A turreted specimen measures . . . *long.* 1·2, *long. spir.* ·59, *lat.* ·5.
A swollen sp. . . „ 1·, „ ·42, „ .5.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 794 contains 3 sp.: one turreted, one swollen, one curiously mended after fracture.

231. GLANDINA TURRIS, *Pfr.*

Achatina turris (Glandina) *Pfr. Symb.* iii. p. 91, no. 126:—*Mon. Helic.* ii. 288.—*Rve. Conch. Ic.* pl. 13, f. 45.—*Desh. l. c.* 186, no. 51, pl. 134, f. 1, 2.—*B. M. Cat. Pulm.* pt. i. p. 25, no. 29.
=G. Albersi, var. turrita, *P. P. C., Cat. Prov.*
Acicula turris, *H. & A. Ad. Gen.* vol. ii. p. 109.

This species is kept separate provisionally on the authority of Dr. Pfeiffer. As only one specimen was found in the Mazatlan collection, it would not be fair to decide without further evidence. It appears to differ from the elongated var. of G. Albersi, simply in the still greater elongation, greater arcuation of the columella, and greater fineness of the striæ. But all these characters are variable in the other species. *Long.* 1·2; *long. spir.* ·61, *lat.* ·48.

Hab.—Mexico, *Liebmann.*—Mazatlan; 1 sp. among Physæ; *L'pool Col.*

Tablet 795 contains the specimen.

Family HELICIDÆ.

Genus ORTHALICUS, *Beck.*

H. & A. Ad. Gen. vol. ii. p. 154. The animal differs from that of Bulimus proper, according to *Troschel* in *Zeit. f. Mal.* 1847, p. 50, (note.)

Bulimus, pars, *auct.*

232. Orthalicus zebra, *Müll.*

Buccinum zebra, *Müll. Verm.* p. 138, no. 331.—*List. Conch.* pl. 580, f. 34.—*Fav. Conch.* pl. 65, f. M. 2.—*Seba, Mus.* 3, t. 39, f. 54, 55.—*Gualt. Ind.* pl. 5, f. N. (Zebra Mülleri,) *Chemn. Conch.* vol. ix. pt. 2, p. 24, pl. 118, f. 1015-6.—*Kammerer, Cab. rud.* pl. 80, f. 4.

Bulla zebra, *Gmel.* p. 3431, no. 31.—*Schroet. Flussconch.* p. 325, pl. min. A, f. 4, + no. 123:—*Einl.* vol. ii. p. 216, no. 143.—*Dillw. Descr. Cat.* vol. i. p. 494, no. 52.

Bulimus zebra, *Desh.* in *Lam. An. s. Vert.* vol. viii. p. 223.—*Anton Verz.* p. 43, no. 1577.—*D'Orb. Moll. Cub.* vol. i. p. 174, pl. 6, f. 9, 10.—*Pfr. Symb.* no. 372.—*Mke. in Zeit. f. Mal.* 1850, p. 163, no. 4.

Achatina zebra, *Pfr. Symb.* ii. p. 135: non *Chemn.* nec *Lam.*—*Kammerer*, p. 126, pl. 10, f. 4.

Orthalicus undatus et zebra, *Beck. Ind.* p. 59, no. 5, 6.

Orthalicus zebra, *H. & A. Ad. Gen.* vol. ii. p. 154, pl. 75, f. 6, 6 a.

Helix undata, *Daudeb. Hist. des Moll.* pl. 114, f. 5, 8; pl. 115.—*Wagn.* in *Spix. Test. Braz.* p. 9, no. 12, pl. 9, f. 2.—*Moric. Mem. de Geneve.* vol. vii. pt. 2, p. 423, no. 14.—(? Non H. undata, *Dillw.* p. 958.)

Helix (Cochlostyla) undata, *Fér. Hist.* p. 337, pl. 114, f. 5—8, pl. 115, f. 1—6.—*D'Orb. Synops.* p. 8.

Bulimus undatus, *Brug. Dict.* no. 38:—*Enc. Meth.* p. 320, no. 38.—*Lam.* loc. cit. no. 5.—*Valenc.* in *Humb. Zool.* vol. ii. p. 245, pl. 55, f. 1.—*Küst. Bul.* p. 6, pl. 2, f. 4, 5.—*B. M. Cat. D'Orb. Moll.* p. 13, no. 134:—*Cuba Moll.* p. 10, no. 93.

Var. = Bulimus melanocheilus, *Val.* in *Humb. Zool.* vol. ii. p. 246, pl. 55, f. 3.

Var. = Orthalicus livens, *Beck. Ind.* p. 59, no. 7.

+ Bulimus zigzag, *Lam.* loc. cit. no. 4, teste *Desh.*

+ Bulimus princeps, *Brod. Proc. Zool. Soc.* 1832:—*Sow. Conch. Ill.* f. 18.

Helix (Cochlostyla) princeps, *D'Orb. Synops.* p. 8.
Orthalicus princeps, *Beck. Ind.* p. 59, no. 3.
Achatina pulchella, *Spix.*

This well known and widely distributed species is the only land shell which appears at all common at Mazatlan. It varies greatly in pattern, as will be seen by the following list. Most of the shells were young, but characteristic. The first 3 or 4 whirls rarely display any painting. *Long.* 2·1, *lat.* 1·1.

Hab.—Brazils, Peru, Columbia, *D'Orbigny.*—Cuba, *Sagra.*—Conchagua, Broderip.—Mazatlan; common; *L'pool Col.*

Tablet 796 contains 5 sp., with very large dark patches.—797, 4 do. patches diagonal.—798, 3 do. patches smaller.—799, 1 do. patches clouded.—800, 5 do. gathering into knots.—801, 7 do. normal painting, knotted in spiral bands.—802, 4 do. very fine, scarcely zigzag stripes.—803, 3 do. irregularly crowded.—804, 4 do. knotted pattern extremely faint.—805, 3 do. yellowish, with spiral brown lines at the base.—806, 1 sp. yellowish, without pattern.—807, 5 sp. elongated form.—808, 1 sp. with winter epiphragm.—809, 3 sp. broken and mended by the animal.

233. Orthalicus Ziegleri, *Pfr.*

Bulimus Ziegleri, *Pfr. Proc. Zool. Soc.* 1846, p. 113, no. 25:—Symb. no. 472.
Leiostracus Ziegleri, *H. & A. Ad. Gen.* vol. ii. p. 151.

This shell is placed by Messrs. Adams in a subgenus of Otostomus. It has however a sharp, non-reflected lip; as well as a very small, scarcely covered umbilicus. A very few specimens were found with the Physæ. An unusually large one, in which the linear patches of colour are almost evanescent, measures *long.* ·69, *long. spir.* ·35, *lat.* ·34.

Hab.—Central America, *Largilliert.*—Mexico, Liebmann.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 810 contains 2 sp., one of normal colouring, the other the pale variety.

234. Orthalicus ? Mexicanus, *Lam.*

Bulimus Mexicanus, *Lam. An. s. Vert.* vol. viii. p. 232, no. 23.—*Val.* in *Humb. Rec. Zool.*
Leiostracus Mexicanus, *H. & A. Ad. Gen.* ii. 150.
= Helix vittata, *Daud. Hist. Moll.* no. 397.

Tablet 811 contains a sketch of a solitary specimen which was found by Mr. Archer among the small shells. It was referred by Mr. Cuming to Bulinus Broderipii, *Sow.* in *Proc. Zool. Soc.* 1832:—*Conch. Ill.* f. 1. (=Plectostylus Broderipii, *H. & A. Ad. Gen.* ii. 155:) but as it does not accord with the figures of that Chilian species, it was perhaps an oversight. Lamarck's description might also serve for B. Ziegleri, which this shell very greatly resembles. It is however more inflated and thinner. *Long.* ·65, *long. spir.* ·35, *lat.* ·4.

Hab.—Mexico, *Humboldt & Bonpland.*—? Mazatlan; 1 sp. with B. Ziegleri; *L'pool Col.*

Order LIMNOPHILA.

Family AURICULIDÆ.

Genus MELAMPUS, *Montf.*

Melampus, *Montf. Conch. Syst.* 1810.

Conovulus, *Lam.* 1812. This genus was afterwards suppressed by its author, and united to Auricula.

235. Melampus olivaceus, *n. s.*

M. t. parvâ, sublævi, conoideâ, spirâ depressâ, infra suturam indistinctam obscure angulatâ; albidâ, fusco-purpureo irregulariter tessellatâ, epidermide adhærente olivaceâ indutâ; anfr. vii. *vix monstrantibus, planatis; aperturâ longâ, angustâ, ad marginem fusco-purpureâ, intus albâ; labro ad marginem acuto, intus dentato, dentibus in liras acutas, in adultâ sæpe obsoletas, decurrentibus; labio tenui, plicâ unâ parietali transversâ, inter denticulas duas sitâ, in juniore denticulis numerosis intus conditis; columellâ plicâ unâ obliquâ, ad basin excurrente; parietibus internis in adultâ absorptis.*

Melampus bidentatus, *Moerch* in *Mus. Cum.*: non *Say.*

Moerch must surely have been in error in regarding this species as a variety of M. bidentatus. It is much more nearly allied to the Voluta coffea of Linn. The specimens, of which many hundreds were sent, are very constant in the characters above given; of which the most distinguishing are the olive green epidermis, with the irregular purplish brown tessellated

patches often shewing through; the sharp purplish outer lip, well armed with white ridges within, in the young shell, which afterwards develope strong teeth at the ends, and are last of all absorbed; and the thin inner lip, which developes one strong transverse parietal plate between two small denticles (others being just discernable in the young shell), and one large slanting columellar fold, which winds round the base of the pillar, making an umbilical chink. A few extremely faint spiral striæ are sometimes seen on the epidermis, near the base and above the bluntly angled shoulder. *Long.* ·65, *long. spir.* ·11, *lat.* ·38, *mean div.* 110°.

Hab.—Mazatlan, *Lieut. Shipley.*—Do.; not uncommon; *L'pool Col.*

Tablet 812 contains 9 sp. normal state.—813, 4 do. dark variety.—814, 4 do. light var.

Family LIMNEIDÆ.

Genus APLEXA, *Flem.*

Hist. Br. An. 1828, p. 276.—*Gray, Proc. Zool. Soc.* 1847, p. 180:—*do. Turt.* ed. ii.—*Beck* in *Phil. Handb. Conch.* p. 255.

Bulinus, *Adanson*, teste *Gray Fig. Moll. An.* 1850, p. 119.—*H. & A. Ad. Gen.* vol. ii. p. 259.—Non Bulinus, *Adanson*, teste *Gray, Proc. Zool. Soc.* 1847, p. 180, nec *Beck* in *Phil. Handb. Conch.* p. 255:—nec Bulinus, *Sow.*

Physa, pars, *auct.* Mantle simple edged. The shells of this section indicate affinity with the A. hypnorum, the animal of which is sufficiently distinct from the typical Physæ. The species in this genus are extremely difficult to distinguish, especially in the young state. The naturalist has to rely principally on the general habit, individual characters being subject to variation.

236. Aplexa aurantia, *n. s.*

A. t. tenui, ovatâ, lævigatâ seu striis incrementi exillimis. nitidâ, aurantio-corneâ, ad spiram fuscâ; spirâ parvâ, in adultâ semper erosâ; anfr. circiter vii., *subplanatis, tumidis; aperturâ satis dilatatâ; labio tenuissimo arcuato; columellâ vix plicatâ.*

Physa Peruviana, *Mke.* in *Zeit. f. Mal.* 1850, p. 163, no. 6:—*P. P. C. Cat. Prov.*: non *Gray, Spic. Zool.* p. 5, pl. 6, f. 10.

This fine species, which is generally named P. Peruviana in collections, is quite distinct from the types in the Br. Mus. It much more nearly approaches A. Maugeræ, which is believed to be a Caribbæan species, (not Californian, as stated by *Woodw. Man.* ii. 171.) It differs in shape, which is never so elongated, and in colour which is almost always orange horn, with a tendency to darker shades, in rays, below the suture. Shell swollen, thin, glossy, with an extremely thin columellar lip, projecting beyond the aperture, and indented at the base of the body whirl. The length of the spire varies in different specimens, as does also the amount of convexity. The true A. Peruviana has a very prominent apex, with shouldered, swollen body whirl. Allowance must be made in the following measurements for the constant erosion of the apex. A slender specimen measures *long.* 1·23, *long. spir.* ·27, *lat.* ·63.
A swollen sp. „ 1·25, „ ·24, „ ·7.
The largest specimen must have measured 1·43: *mean div.* 60°.

Hab.—Mazatlan; not common: *L'pool Col.*

Tablet 815 contains 5 sp. slender.—816, 5 do. swollen.—817, 5 do. normal state.—818, 5 do. dark variety, approaching A. Maugeræ in texture.—819, 2 sp. of distorted growth.

237. APLEXA ELATA, *Gould.*

Physa e., *Gould Cal. & Mex. Shells*, p. 6, pl. 14, f. 4.

It is almost impossible to draw the line between this species and the young of A. aurantia. Nevertheless, as a vast number of this shell were sent, and very few of the other, it is presumed that it is adult. It differs considerably from the adult form of A. aurantia, being very much smaller, thinner, more pointed, of a light horn colour, with the whirls extremely smooth, and the apex never eroded. In shape it is more like A. Maugeræ. Exactly at the suture there is generally an ill-defined line of lighter colour with one of darker colour below. It varies somewhat, like the last species, in the comparative length of the spire. An unusually large specimen measures *long.* 1·08, *long. spir.* ·28, *lat.* ·5, *mean div.* 50°.

Hab.—Lower California, *Major Rich.*—Mazatlan; very common; *L'pool Col.*

Tablet 820 contains 10 sp. normal state.—821, 6 do. more swollen.—822, 9 do. colour approaching A. aurantia.—823, a distorted sp. slightly angled at the suture.

Genus PLANORBIS, *Guettard.*

238. Planorbis tumens, *n. s.*

P. t. rapide tumente, parvâ, corneâ seu rufo-fuscâ; anfractibus iv.-v., *concentrice tenue striatis, striis undulatis; suturis valde impressis; latere altero prope suturam subangulato, seu interdum subcarinato; altero rotundato; umbilico altissimo; aperturâ margine sinuato, latere altero supra extante, infra compressâ, altero supra planatâ, infra productâ, capaci, rotundatâ; labio tenuissimo.*

Planorbis affinis, *P. P. C. Cat. Prov.*; non *C. B. Ad.* in *Contr. Conch.* no. 3. p. 44.

Planorbis tenagophilus, *Mke. Zeit. f. Mal.* 1850, p. 163, no. 5: non *D'Orb., B. M. Cat. Moll.* p. 25, no. 234.

This species is so variable that it is difficult to describe it so as to include all the specimens and yet separate it from its congeners. Aberrant individuals on the one side closely approach P. affinis, on the other P. lentus, *Say.* The three may hereafter be proved identical: but the general habit of P. tumens, as gathered from repeated examinations of many hundred specimens, is sufficiently distinct from the Jamaica species. The whirls are more rapidly enlarging, more swollen, and the lip more shouldered. An unusually large specimen measures *long.* ·63, *lat.* ·58, *alt.* ·27.

Hab.—Mazatlan; not uncommon; *L'pool Col.*

Tablet 824 contains 3 sp., deep narrow umbilicus.—825, 5 do. ordinary state.—826, 4 do. umbilical suture large—827, 4 do. umbilicus flattened.—828, 3 do. base rounded.

Tablet 829 contains 3 sp. reddish brown var., spreading.—830, 3 do. ordinary state.—831, 3 do. keeled.

Tablet 832 contains 7 sp. distorted growth.

Order THALASSOPHILA.

Family SIPHONARIADÆ.

Genus SIPHONARIA, *Gray.*

Gray in *Sow. Gen.* part xxi. 1824.—*Blainv. Dict. Sc. Nat.* vol. xxxii. p. 267.

Mouretia, *(Gray) Sow.* 1835.—Trimusculus, *Schmidt*, 1832.

This remarkable genus does not appear to be rich in species at Mazatlan. The magnificent S. gigas (? + characteristica), though traveling as far north as S. W. Mexico, where it is not uncommon *(P. P. C.)*, was entirely absent (adult) from this collection.

239. SIPHONARIA LECANIUM, *Phil.*

S. t. parvâ, plerumque ovatâ, interdum subcirculari, ad canalem projiciente; subconicâ, seu valde depressâ; cinereâ, fuscâ varie pictâ; epidermide tenui, adhærente; costis æqualiter seu inæqualiter distantibus, subacutis seu valde rotundatis, interstitiis sæpius costulis instructis; costis majoribus xii.-xxii.; *costis et costulis tenuissime striatis, striulis radiantibus, subrugulosis; costis et margine interno interdum albidis; vertice subcentrali, lævi, planatâ; paginâ internâ seu atrâ, seu fuscâ, rarius pallidâ, rarissime virescente; margine seu irregulariter crenulato seu stellato; costis rotundatis excurrentibus; canali declivi.*

Phil. in *Zeit. f. Mal.* 1846, p. 51, no. 18.—*Menke* in *Zeit. f. Mal.* 1847, p. 177, no. 1. diagnosi aucta.—Nunc diagnosi valde aucta.

It cannot be expected that any one should recognize this species from so comprehensive a description; and yet any narrower definition would shut out shells that I am unable to separate from the typical forms. In its ordinary state the shell is subconical, thin, with a variable number of irregularly disposed, rather sharp ribs, somewhat projecting, and generally rubbed, shewing a white surface underneath. Between these ribs are an equally variable number of riblets, not projecting; and over the whole surface, ribs included, are microscopic striæ. When the creature grows in sheltered situations, it spreads out, becomes flat and large, the ribs swell, become rounded, and develop at the margin into beautiful palmations. So different is this form from the usual one that if they were each at all constant in their characters, no one would suspect them of being identical. Yet the variations in each are so extraordinary, and the intermediate forms so numerous, that I have found it impossible to separate them. Often, both in the flat and conical forms, the riblets develop into principal ribs, until all are nearly of the same size. It then closely approximates the next species. Interior of a rich iridescent brown or brownish black, generally light at the margin, some-

times throughout. The apex in the adult is always flattened. The smallest specimen found, ·03 in length, has much the aspect of a Navicella. The apex is terminal, spiral, of a very few whirls, involute, like a tumid Planorbis, turned a little from the middle, away from the canal, and apparently sinistral. The head mark is at the opposite end of the shell. A partition is soon placed across the spiral part, which then drops off at a variable period, leaving a horse-shoe cicatrix. In the specimens examined, the angle of adherence varied somewhat, as did the degree of revolution of the spire. The family is thus separated by another character from Patellidæ, in which the apex is never spiral, and from the true Calyptræidæ in which it is persistent. The first portion of the normal shell which is formed is smooth. Presently fine striæ are developed; afterwards, often quite suddenly, large ribs. There is nothing in the juvenile shell to shew whether it will develop into the flat or the conical form. The channel is not apparent in the very young shell; but soon becomes developed to an abnormally large size. The largest shell of the flattened form (including palmations) measures *long.* ·96, *lat.* ·89, *alt.* ·18.
A subconical sp. ,, ,, ·76, ,, ·65, ,, ·24.

The flattened form, which is rare, may be distinguished as S. L. *var.* PALMATA: *t. planatâ, costis magnis, rotundatis, ad marginem projicientibus, intus cavatis, quasi palmatis.*—It is probably the S. denticulata of *Mke.* (non *Quoy & Gaim.) Zeit. f. Mal.* 1851, p. 38, no. 136.

Hab.—Mazatlan, Philippi;—do. *Melchers;* do. abundant; *L'pool Col.*

Tablet 833 contains the youngest specimen, Navicella-shaped, and an older one with the scar from the detached spiral part.—834, 8 sp. jun. different ages, with spiral part visible.—835, 9 sp. do. spiral part detached.

Tablet 836 contains 3 sp. *var. palmata,* very few (11+) ribs.—837, 4 do. large and regular.—838, 5 do. irregular.—839, 4 do. ribs very numerous, (22,) smaller.—840, 4 do. interstices of palmations slightly crenate.—841, 5 do. interstices crenated.—842, 4 do. greenish tinge.—843, 5 do. light brown.—844, 4 do. very dark.—845, 3 do. nearly black.

Intermediate form; slightly palmated margin. Tablet 846 contains 3 sp. approaching var. palmata.—847, 3 do. dark brown.—848, 3 do. white margin.—849, 3 do. light brown.—850, 2 do. chocolate colour.

Ordinary state.—Tablet 851 contains 3 sp. light brown.—852, 4 do. darker.—853, 4 do. whitish margin.—854, 4 do. broad white margin.—855, 4 sp. blackish brown, white margin.—856, 4 do. penciled.—857, 4 do. tessellated.—858, 4 do. nearly black.

Specimens shewing exterior.—859, 3 sp. fine growth, with epidermis.—860, 4 do. principal ribs few.—861, 5 do. more numerous.—862, 5 do. principal ribs scarcely developed.—863, 1 do. with very fine crowded riblets, here and there developing into principal ribs.—864, 2 sp. very conical.

Tablet 865 contains 4 sp. probably belonging to this species, but approaching S. æquilirata. Principal ribs scarcely traceable.

240. SIPHONARIA ÆQUILIRATA, *n. s.*

S. t. subconicâ, ovali, regulari, liris numerosis subrûgulosis, æqualibus, radiatim ornatâ, interstitiis haud latis, lævibus; fusco-olivaceâ, liris altis; epidermide tenui, adhærente; paginâ internâ fuscâ, vix iridescente; margine crenulato; canali subcentrali, extus haud prominente.

One specimen of beautiful growth in the Mazatlan collection agrees with a larger but somewhat irregular one in that of Mr. Cuming, in characters which appear to separate it from all varieties of S. Lecanium. Riblets equal, interstices smooth, channel nearer the middle and not conspicuous either by swelling or special marking outside. The Mazatlan specimen has much broader interstices than that of Mr. Cuming; but as the riblets are bifurcating, it is probably not fully grown. There is no trace of striulæ. The examination of more specimens may possibly merge it into the polymorphous S. Lecanium, from the extreme variety of which the non-prominence of the canal appears to separate it. Mr. Cuming's specimen measures *long.* ·83, *lat.* ·57, *alt.* ·3.

Hab.—Gulf of California, *Lieut. Shipley.*—Mazatlan; 1 sp. only; *L'pool Col.*

Tablet 866 contains the specimen.

241. SIPHONARIA ——— *sp. ind.*

Tablet 867 contains a very young specimen, ·07 by ·05, of Navicella shape, with a large spiral apex, extremely thin, and evidently belonging to a very much larger species than S. Lecanium, possibly to S. gigas.

Hab.—Mazatlan; 1 sp. in shell washings; *L'pool Col.*

Subclass PROSOBRANCHIATA.

In those families in which the first whirls are abnormal as compared with the rest, as compared with the rest, these are called the *nucleus*, although they may be more than the part so formed in the egg, and their first whirl the *apex*. The measurements marked *div.* represent the *mean divergence* of the outlines of the spire.

Order HETEROPODA.

Family IANTHINIDÆ.

This aberrant group is ranked with Carinaria in the Subclass Heteropoda by *H. & A. Adams, Gen.* vol. ii. p. 85; between Scalaridæ and Stylinidæ by *Philippi, Handb. Conch.* p. 179; next to Ampullariadæ, *Gray*, 1847; with the Heteropoda in Order Pleurobranchiata, *Gray* 1850; between Neritopsidæ and Scalariadæ, in the Suborder Proboscidifera, *Gray*, 1855; next to Trochidæ, *Forbes & Hanl. Br. Moll.* vol. ii. p. 547; in the Family Haliotidæ, *Woodw. Man.* pt. 1, p. 148. It has affinities in all these groups. The vertex is not sinistral as in Pyramidellidæ; but dextral, fixed slanting from the future axis of the shell.

Genus IANTHINA, *Lam.*

It is necessary that more materials should be collected, and the animals observed, before a decided opinion can be expressed on the species of this genus. Some would reduce most of the forms to one or two species, Dr. Gray even hazarding the conjecture that the two forms usually found together (I. fragilis and I. prolongata) are the sexes of one species, *(B. M. Cat. D'Orb. Moll.* p. 35.) Mr. M'Andrew however found them in the Canaries separate, and miles apart. Others will believe that many different species have been confounded. In the absence of information respecting the animals, it has been thought best to describe the Pacific species as distinct; although it is highly probable that they may hereafter be identified with those from the W. Indies. The smaller Atlantic form is represented, in the Pacific waters, by the beautiful I. bifida, *Nutt.* from the Sandwich Islands.

242. Ianthina striulata, *nom. prov.*

I. t. "*I. fragili*" *simillimâ; nucleo haud valde oblique sito, anfractibus* IV., *globoso, apice planato, suturis nullis; anfracti-*

bus primis lirulis concentricis acutis pulcherrime instructis, postea lineas incrementi monstrantibus; lineis spiralibus plus minusve distinctis; angulo mediano distincto; superne pallidissimâ, infernè violascente; columellâ tenuissimâ, plicâ acutâ instructâ, ad basim plus minusve extortâ; labro plus minusve sinuato, sinu angulato; labio vix projiciente, tenuissimo.

Comp. Ianthina fragilis, *D'Orb.*, *B. M. Cat. Cuba Moll.* p. 23, no. 258:—*B. M. Cat. D'Orb. Moll.* p. 36, no. 316:—*B. M. Cat. Can. Moll.* p. 15, no. 107:—(=I. communis, *Lam. An. s. Vert.* vol. ix. p. 4, pars.)

This shell may hereafter prove to be identical with one of the various Atlantic species. There are two forms called I. fragilis from the W. Indies; one agreeing with this in the separation of colours and sharp columella, but with more pink in the violet tinge; the other agreeing in tint, but with the colour diffused and the columella coarser. All differ essentially from the British I. communis, (of which there are two very different ?varieties) in the very fine concentric liration of the upper whirls, and in the character of the nucleus. This, in I. communis, is sunken, but not flattened at the apex; in the tropical species it is rather prominent, but flattened at the top. It is not so horny as in the next species, and is always persistent. The shape is tolerably constant; but the amount of sinuation in the outer lip somewhat varies. The very young shell is globular, without angular keel. *Long.* ·78, *long. spir.* ·44, *lat.* 1·, *div.* 100°.

Hab.—Mazatlan; abundant; *L'pool Col.*

Tablet 868 contains a very young sp. ·04 across, broken, but shewing the transition between the oblique and straight portions.—869, a young sp. with fry adhering to the suture.—870, 3 sp. depressed form.—871, 5 sp. normal state, jun.—872, 5 do. adult.—873, 4 sp. spire elevated.—874, 3 sp. basal angle produced.—875, 4 do. shoulder curiously swollen.—876, 7 do. broken and mended by the animal.

242, *b.* IANTHINA STRIULATA, *var.* CONTORTA.

I. ?striulata, columellâ maxime contortâ, ad basim productâ, reflexâ, sinu magno, haud angulato.

This shell when taken alone would certainly be regarded as a distinct species: but as several specimens of I. striulata shew

somewhat of an approach to it, it is presumed (in the absence of knowledge of the animal) to be an aberrant variety.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 877 contains the extreme specimen, and a younger one, intermediate. The larger sp. is but slightly waved in the outer lip: another, however, with the same twisted columella, presented the ordinary indentation in the labrum.

243. IANTHINA DECOLLATA, *nom. prov.*

I. t. globosâ; spirâ plus minusve extante, pallide violaceâ; anfractu ultimo pallidissimo, basim versus violaceâ; apice corneo, deciduo; nucleo obliquo, haud extante; suturâ profundâ; labro varie sinuato; columellâ vix contortâ; labio haud porrecto, umbilicum sæpe tegente.

Comp. Ianthina globosa, *Swains. Zool. Ill.* vol. ii. pl. 85, fig. med.

Comp. Ianthina prolongata, *D'Orb., B. M. Cat. Cuba Moll.* p. 23, no. 259; *B. M. Cat. D'Orb. Moll.* p. 35, no. 317; non *Desh.* in *Lam. An. s. Vert.* vol. ix. p. 5, no. 3.

This shell is most closely related to the West Indian species, differing from the specimens examined simply in colour, which instead of being equally diffused on the shell, is confined to the base and spire. It differs from I. prolongata of the Mediterranean and Canaries in the very slight contortion of the columella, which in the Europæan species resembles that of Lymnæa *(Desh.)* If the I. globosa of Swains. represents the W. Indian shell, and not the I. prolongata, as Desh. and Gray suppose, this shell may prove identical with it, when more specimens have been found from other localities. The Mazatlan specimens, though very few, differ considerably in the greater or less exsertion of the spire, inflation of the shoulder and base of the body whirl, and concealment of the umbilicus. The sinuation of the outer lip varies not only in different specimens, but in the same shell at different periods; being sometimes scarcely waved, at others strongly angulated as in I. fragilis, sometimes with a semicircular medial sinus. The nucleus is sunken, rather oblique, with the apex horny and always decollated. In I. prolongata, it is exserted and persistent. The largest sp. measures *long.* 1·02, *long. spir.* ·3, *lat.* ·87, *div.* 105°.
A swollen sp. measures „ ·83, „ ·13, „ ·81, „ 130°.

Hab.—Mazatlan; with I. striulata, extremely rare; *L'pool Col.*

Tablet 878 contains 3 specimens.

Order LATERIBRANCHIATA, *Clark.*

Family DENTALIADÆ.

Genus DENTALIUM, *Linn.*

The fullest account of the animal of this remarkable tribe, will be found in *Clark, Moll. Test. Mar. Brit.* pp. 225—238. It has only a faint analogy with Fissurella; and differs so much from even the most aberrant of the Scutibranchs that the Order, proposed by Clark, is adopted. There are many points of analogy with the Lamellibranchiate Mollusca, and some with the Annelids. Individuals appear to be very rare at Mazatlan, perhaps in consequence of the scarcity of Foraminifera, on which these blind, almost headless creatures voraciously feed.

214. Dentalium liratum, *n. s.*

D. t. solidâ, albâ, tereti, liris longitudinalibus tenuissimis creberrime indutâ; liris in juniorem circiter xii., *in adultam circiter* xxx., *acutis, haud æqualibus; parum arcuatâ, aperturâ branchiali simplici.*

One perfect, though rather small, specimen was found entangled in the byssus of Modiola capax; fragments occurred of a much larger size. *Long.* ·25, *lat.* ·011—·03.

Hab.—Mazatlan; off Modiola capax, Chamæ and Spondyli, very rare; *L'pool Col.*

Tablet 879 contains the perfect specimen, a small do. wedged in the mouth of Trivia sanguinea, and a fragment of a large one, ·065 across.

215. Dentalium hyalinum, *Phil.*

Zeit. f. Mal. 1846, p. 55, no. 27.

Tablet 880 contains a minute shell of a hyaline texture, with an opaque line running along the inner curve, which may be accidental. It probably belongs to the above species described by Philippi from Mazatlan, although that is said to be "versus apicem tenuissime striata," while this, which is extremely young, is smooth. *Long.* ·07, *lat.* ·01—·025.

Hab.—Mazatlan; 1 sp. off Spondylus calcifer; *L'pool Col.*

246. DENTALIUM CORRUGATUM, *n. s.*

D. t. albido-corneâ, subdiaphanâ, parum arcuatâ, gracili, superficie concentrice irregulariter corrugatâ, rugulis minimis, confertissimis ; aperturâ branchiali simplici.

One very young specimen only was found of this species, remarkable for its concentrically wrinkled surface. *Long.* ·05, *lat.* ·005—·01.

Hab.—Mazatlan ; 1 sp. off Spondylus calcifer ; *L'pool Col.*

Tablet 881 contains the specimen.

247. DENTALIUM ? PRETIOSUM, *Nutt.* (teste *Hds.*)

Tablet 882 contains a fragment of a smooth species. It is affiliated to the above, because a specimen in Mr. Darbishire's collection, brought along with Lyonsia diaphana, seems to have come from Mazatlan. This latter, a very small one for the species, measures *long.* 1·56, *lat.* ·05—·15.

Hab.—? Mazatlan ; extremely rare, off Chama ; *L'pool Col.*

ORDER SCUTIBRANCHIATA, *Gray.*

Scutibranchiata + Cyclobranchiata + Pectinibranchiata (pars) *Cuv.*

FAMILY CHITONIDÆ.

Our knowledge of this most aberrant family is very incomplete. Many genera have been proposed by Dr. Gray in the *Proc. Zool. Soc.* 1847, pp. 63, 126, and others by *H. & A. Adams, Gen.* vol. i. pp. 467-484 ; and others by Dr. Shuttleworth of Berne. This fullest account of their physiological structure will be found in "*Middendorff's Malacozoologia gia Rossica,* St. Petersburg, 1847, Part I ; *Beschreibung und Anatomie ganz neuer oder für Russland neuer Chitonen ;*" in which 152 large 4to pages, and 14 plates are devoted to the elucidation of 21 species. Additional information is given in his "*Reise in den Aussersten Norden und Osten Sibiriens,* Part II. St. Petersburg, 1851," pp. 163-183, pl. 13-15.—Most of the Mazatlan species are extremely small. None of them are known to inhabit any other district, except Lophyrus sanguineus, about which there is still some doubt. Throughout the world, they appear to be among the most local of shells.

In the following descriptions, as far as practicable, the terms are employed as proposed by Middendorff, *Mal. Ross.* p. 36. By the *jugum* is meant the ridge running along the middle of the valves; the *mucro* is the apex on the posterior valve: the *valve-lobes* are the prolongations of one valve which fit under the next; the *sinus* lies between them.

Genus LOPHYRUS, *Poli.*

H. & A. Ad. Gen. vol. i. p. 469.—Radsia + Gymnoplax, *Gray.*—Chiton, pars, *auct.*—Plates of insertion in denticulated lobes; integument tessellated with smooth scales.

248. Lophyrus articulatus, *Sow.*

Chiton articulatus, *Sow.* in *Proc. Zool. Soc.* March, 1832, p. 59:—*Conch. Ill.* no. 29, f. 18.—*Zool. Beech. Voy.* p. 150, pl. 41, f. 16.

Lophyrus articulatus, *H. & A. Ad. Gen.* i. 470.

The figure in the *Conch. Ill.* is very accurate; but that in *Beech. Voy.* represents much too strong a sculpture. The Mazatlan specimens rarely display any sculpture at all, being almost universally eroded, even in young specimens. The plainness of the exterior is however abundantly compensated for by the great beauty of the inner structure of the valves, which the large number of specimens sent allow to be freely examined. The form is sometimes broad, with nearly straight sutures; sometimes elongated, with arched back, and sutures bent, occasionally into the form of a ⟋⟍. Very rarely the shell is indented on each side of the jugum, rudely presenting a likeness to a Trilobite. The surface of the valves, when perfect, is crowded with minute pustules; diagonal lines scarcely marked. Colour olive green shaded into reddish brown at the ridge, with irregular longitudinal streaks of brown olive on each side: faint narrow rays of the same tinge on the terminal valves, and irregularly waved penciling over the surface of the diagonal areas. Inside bluish green; valve-lobes long and flattened, with a broad medial sinus. The surface within, under the microscope, is extremely finely corrugated. The margin is formed of fine, irregular plates, each sometimes branching into a plume; these are interrupted in the medial valves by one slit on each side, in the terminal ones by 14—20. From these proceed rows of punctures to the axis

of the shell; in the young state visible within, in the adult concealed, but generally traceable in the eroded surface. At the junctions of the valves, close above the valve-lobes, may be seen rows of large open cells, with smaller ones above, somewhat resembling the parenchyma of a leaf cut across. Along the sinus is another row of plates as in the margin. The structure of the shell presents many points of analogy with the Cirripedes: as does the animal with others of the Articulata. The integument is crowded with very deciduous, hard, green scales, sharply jointed, having 3 sides, of which one is corrugated, the others smooth. They are somewhat of the shape of a pistachio nut. The following measurements are not perfectly exact, in consequence of the curvature of the specimens.

A broad specimen measures *long.* 2·7, *lat.* 1·7, *div.* 120°.
The largest specimen „ „ 4·2, „ 2·2, „ 105°.

Hab.—San Blas, under stones, *Beechey.*—Mazatlan; abundant, but much worn; *L'pool Col.*

Tablet 883 contains 4 sp. in the usual condition.—884, 1 do. very perfect.—885, 3 sp. broad form.—886, 2 sp. elongated.—887, 2 sp. surface eroded, displaying the inner structure.—888, 1 sp. with very irregular margins, and Conia attached.—889, 1 sp. obscurely trilobed.—890, 2 sp. with head valves abnormally large, perhaps from limpets attached.—891, valves of very young sp.—892, 2 sp. valves separate to shew structure.

Tablet 893 contains an extremely young specimen, ·16 in length, which probably belongs to this species. The valves are more strongly pustulose, and the marginal scales much larger in proportion than in the adult. There is also a row of hairy processes at the mantle margin, below the scales, which may be connected with the gills. It has more the aspect of C. lævigatus, *Sow. Proc. Zool. Soc.* 1832, p. 59: *Conch. Ill.* sp. 30, f. 18*, which is from the same locality, and may prove to be only a variety of C. articulatus.

249. LOPHYRUS ALBOLINEATUS, *Brod. & Sow.*

Chiton albolineatus, *Zool. Journ.* vol. iv. p. 368.—*Sow. Conch. Ill.* sp. 42, f. 39.—*Zool. Beech. Voy.* p. 149, pl. 40, f. 4.—*Rve. Conch. Ic.*

Lophyrus albolineatus, *H. & A. Ad. Gen.* i. p. 470.

This beautiful species is remarkable for the different appearance of valves on the same specimen, which may be either

albolineate or quite black. Normally there is a black line on the ridge, bounded by two white ones; diagonal areas and terminal valves white, penciled with brown in finely waved transverse lines. Besides the colour, shape and delicate texture, it differs from the young of L. articulatus in the following particulars. Surface (under the microscope) regularly granulated in diagonal rows; granules larger in proportion. Radiating lines of punctures almost always visible within. Plates of insertion in simple rows, not plumed. Sinus with irregular transverse incisions internally. Substance of valves next the lobes with a row of larger cells. Scales of margin more grey, rounder, more deciduous.—In the young shell, the granules on the diagonal areas are much larger in proportion. In addition are seen extremely fine striæ, diagonal over the areas, longitudinal over the rest. The marginal scales are much larger in proportion, and are bounded by a row of gill-like hairy proceses, as in the young of the last species.—The largest specimen measures *long.* 1·8, *lat.* ·9, *div.* 115°.

Hab.—Mazatlan; *Belcher.*—Do.; rare; *L'pool Col.*

Tablet 894 contains 3 extremely young specimens, the smallest ·18 in length. In one, most of the valves are separate, displaying the same structure as in the adult. The mantle shews clearly the marks of insertion; and, with the dried remains of the animal, is so transparent that the lingual ribbon is clearly traceable within, ·04 by ·0075 in.

Tablet 895 contains three specimens; the largest, one with the margin perfect, and one with black valves intercalated.—896, 2 sp. with the valves separate, and 2 nearly black valves to shew structure.

250. LOPHYRUS STRIATO-SQUAMOSUS, *n. s.*

L. t. subrotundatâ, depressâ (ad angulam 140°), pallide fusco-olivaceâ; valvis totâ superficie dense granulatis; areis lateralibus satis distinctis; valvis latis, vix curvatis, vix mucronatis; jugo vix distincto, tenuissime longitudinaliter striato; marginibus lateralibus planatis: mucrone superiore, vix distincto; limbo pallii squamis solidis, ovalibus, magnis, haud confertis, instructo. squamulæ cujusque dimidio alte striato; marginibus valvarum serratis, fissuris in valvis intermediis unâ in latere utroque, in valvis terminalibus circiter xii.; *valvarum lobis magnis, valde arcuatis.*

The serrations of the margin in the only perfect specimen found are distinctly visible through the dried cuticle, as they are also in some dead valves in other respects agreeing with the shell. Below the large scales of the mantle margin appears a row of gill-like flattened hairs, as in the young of L. articulatus and albolineatus. *Long.* ·17, *lat.* ·12, *alt.* ·04.

Hab.—Mazatlan; 1 sp. off Spondylus calcifer; *L'pool Col.*

Tablet 897 contains the specimen.

Genus ?TONICIA, *Gray.*

Proc. Zool. Soc. 1847, p. 65.—*H. & A. Ad. Gen.* vol. i. p. 473.—Chiton, pars, *auct.* Plates of insertion as in Lophyrus: mantle smooth.

251. ? Tonicia Forbesii, *n. s.*

? T. t. ovatâ, subelevatâ (ad angulam 115°) brunneâ, olivaceo varie pictâ; valvis intermediis mucronatis, sulcis in jugo V-formibus a mucronibus projicientibus decurrentibus; lineis diagonalibus valde tuberculatis; areis lateralibus sparsim punctatis, ad valvarum interstitia tuberculato-corrugatis; areis centralibus rugis curvatis divergentibus, in valvis terminalibus circiter xiii.; *mucrone conspicuo; limbo pallii sublævi, tenuiori; valvarum lobis intus declivibus, sinu alto, lato; jugo intus roseo; marginibus valvarum et sinus dense serratis, fissuris in valvis intermediis unâ in latere utroque, in valvis terminalibus rugis externis convenientibus.*

Two specimens were found of this very beautiful species, which is dedicated to the memory of the learned and deeply lamented Prof. E. Forbes, whose promised assistance, had he lived, might have prevented many errors in the present work. Neither of the specimens shew any trace of imbricated scales, though they may possibly exist. The structure of the marginal plates closely resembles that of Lophyrus albolineatus. *Long.* ·78, *lat.* ·45, *alt.* ·14.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 898 contains the finest specimen; the other is in Mr. Darbishire's cabinet.

April 1856.

Genus LEPIDOPLEURUS, *Risso.*

H. & A. Ad. Gen. vol. i., p. 471.—Ischnochiton, *Gray, Proc. Zool. Soc.* 1847, p. 126. Mantle scales very minute, grooved: insertion-plates thin, smooth-edged.

252. Lepidopleurus sanguineus, *Rve.*

Chiton sanguineus, *Rve. Conch. Ic.* pl. 17, f. 98.

Comp. Chiton limaciformis, *Sow. Proc. Zool. Soc.* 1832, p. 26:—*Conch. Ill.* sp. 58, f. 38.—*Rve. Conch. Ic.* pl. 8, sp. 42. (Columbia, Sow.: Inner Lobos Is., Peru, and Guacomayo, under stones at low water, *Cuming.*)

This is probably not the Ch. sanguineus of Guilding, from St. Vincent's, which is quoted by Reeve in the Conch. Ic.; and is certainly not the Ch. sanguineus of Dr. Cutting, from Barbadoes, in the Bristol Museum. It is however identical with the specimens in the Cumingian collection, and most closely resembles Ch. limaciformis. There may be a difference in the integument, which the imperfect state of the specimens has failed to display. The Mazatlan shells are more generally tuberculated on the terminal valves than on the typical specimens of the species.

The mode of attachment is quite different in this shell from that of Lophyrus. The valve margin has an outer and an inner rim; the outer being a simple continuation of the external shell layer; the inner being a white, sharp ridge, cut by 10—14 slits in the terminal valves; so as to give the appearance of a lip with a row of incisor teeth within. The central valves have one slit. The radiating punctures are elongated. Inside rose-coloured; outside brownish pink, or dark olive green, or brown, or yellowish irregularly spotted with green. Surface deeply furrowed with irregular longitudinal lines, waved at the sharply angular diagonal lines. The terminal valves are tuberculose, finely so above, coarsely below. Interior surface finely corrugated and ridged for the muscular attachments. Valve lobes small, arched; sinus very large. The valves are easily loosened from the membrane, which is generally thin and smooth, sometimes with an irregular whitish deposit, apparently not of organic matter. *Long.* 1·04, *lat.* ·4, *div.* 105°.

Hab.—Mazatlan; very rare; *L'pool Col.*

Tablet 899 contains 4 sp. various colours.—900, 2 sp. opened to show the valves.

253. LEPIDOPLEURUS CLATHRATUS, *n. s.*

L. t. subrotundatâ, depressâ, (ad angulam 130°*.) fusco-olivaceâ; valvis latissimis, marginibus lobatis, interstitiis subrectis; valvis intermediis, in jugo et (plus minusve) totâ superficie granulatis; costis duabus, tuberculis prævalidis munitis, unâ diagonali, alterâ supra marginem decurrente; areis lateralibus parvis, granulatis; areis centralibus clathris* iv. *utroque in latere longitudinalibus munitis, clathris tuberculatis, interstitiis granulatis; valvâ anticâ costibus radiantibus circiter* xi. *rotundatis, subtuberculatis; limbo pallii latissimo, squamulis minimis, mollibus, conferto; marginibus valvarum simplicibus, antico fissuris* ix. *ad costas haud convenientibus, testâ externâ, quasi subgrundâ, circumeunte.*

One very small specimen was discovered on a stone to which a Crucibulum had been attached, beautifully perfect except in the loss of the anterior valve. A dead anterior valve was found of a much larger specimen, displaying a marginal structure like that of L. sanguineus. The shell is remarkable for the strong bars across the ventral areas, and the stout rows of tubercles which run, the one diagonally, the other along the interstitial margin. The mantle is very broad, and crowded with minute scales. *Long.* ·17, *lat.* ·12, *alt.* ·02.

Hab.—Mazatlan; under stones, extremely rare; *L'pool Col.*

Tablet 901 contains the specimen.

254. LEPIDOPLEURUS BULLATUS, *n. s.*

L. t. subovatâ, elevatâ (ad angulam 110°*,) olivaceâ; valvis intermediis lineis diagonalibus bullis extantibus ornatis; areis lateralibus angustissimis, tuberculatis, interdum bullis munitis; areis centralibus lineis tubercularum, in utrâque parte circiter* vii., *lineis diagonalibus perpendicularibus: interstitiis ubique granulatis; valvis terminalibus lineis bullarum radiantibus circiter* xi., *mucrone subconspicuo; limbo pallii lato, pilulis minimis instructo; valvarum lobis biangulatis, sinu alto; marginibus valvarum simplicibus, in valvis intermediis fissurâ uno, terminalibus circiter* vii., *margine externo tegente.*

One fresh specimen (somewhat crushed in extraction) and a few perfect valves were found of this species, which is characterized by the very strong row of tubercles, (like pebbles) which lie on the diagonal line; by the rows of somewhat strong tubercles on the central area, running perpendicularly from the

diagonal towards the jugum; and the granules over the whole surface, somewhat corrugated on the jugum. The internal plates of all the valves have an external projection from the outer surface, as in L. sanguineus. *Long.* ·17, *lat.* ·12, *alt.* ·03.

Hab.—Mazatlan; off Spondylus calcifer, extremely rare; *L'pool Col.*

Tablet 902 contains the sp. and 2 odd valves.

254, *b*. LEPIDOPLEURUS BULLATUS, *var.* CALCIFERUS.

L. ? bullatus, areis lateralibus tuberculatis, sine bullis, lineâ diagonali quasi calculis instructâ; areis centralibus lineis tuberculorum irregularibus, tuberculis minoribus; pilulis pallii majoribus, confertissimis.

Tablet 903 contains one specimen which presents the above differences. Whether they be specific, cannot be determined without other and older specimens.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

255. ? LEPIDOPLEURUS MAC-ANDREI, *n. s.*

? L. t. "Lophyro striato-squamoso" valvis et limbo pallii fere omnino simulante, sed marginibus valvarum acutis, haud serratis.

A smashed specimen in fresh condition was found on a Spondylus, not distinguishable externally from Lophyrus striato-squamosus, but unexpectedly presenting the sharp insertion-plates of Lepidopleurus, at the same time that the scales agreed exactly in the remarkable character of the former species. Not daring to build on such imperfect data, I suspended my judment: but when examining some specimens of Margaritiphora Mazatlanica in the collection of T. Nuttall, Esq., I was fortunate enough to discover between two laminæ a perfect little Chiton, which on examination turned out to be exactly identical with the smashed specimen from the Spondylus. Having loosened a terminal valve, and subjected it to repeated examinations under a half-inch achromatic, I am unable to discover any trace of serration,* while in L. striato-squamosus it is unmistakably evident. In the absence of further evidence, we are obliged to conclude, either (1) that the same species

* In examining young Chitons, it is necessary to guard against being misled by the gill-like lamina, which, passing over the insertion-plates, is apt to give them (under a low magnifier) a serrated appearance.

may adopt both forms of marginal insertion at different periods of growth, which is contrary to our observation in the young of other species; or (2) that a different creature, belonging by its plates to one genus, puts on the exact appearance of a species in another, even to the very conspicuous scales, which are forbidden by the diagnosis to Lepidopleurus, and are also striated which is equally forbidden in Lophyrus. Under either supposition, it would appear that we have not yet attained a correct knowledge of the principles of division to be adopted in this most remarkable family. *Long.* ·13, *lat.* ·08, *alt.* .025.

Hab.—Mazatlan; on Spondylus calcifer, extremely rare; *L'pool Col.*

Tablet 904 contains the perfect specimen, kindly presented by T. Nuttall, Esq. Of its habitat nothing is certainly known. The Avicula to which it adhered was exactly like the Mazatlan shells; and there were also found on its surface several specimens of Septifer Cumingianus, and two of a species of Cæcum, both identical with those from Mazatlan.

256. ? LEPIDOPLEURUS BEANII, *n. s.*

? L. t. ovatâ, elevatâ (ad angulam 110°), fusco-olivaceâ, seu albido cæruleoque maculatâ; valvis intermediis valde mucronatis, interstitiis curvatis, marginibus subrotundatis; valvâ posticâ depressâ, excavatâ, mucrone minimo, superiore; jugo et areis lateralibus indistinctis: superficie totâ granulis instructâ, et punctulis minimis confertim ornatâ: valvarum lobis magnis, curvatis, sinu planato; marginibus acutis, fissuris circiter x. *valvis terminalibus, unâ in utroque latere, intermediis; marginibus externis prominentibus; limbo pallii piluloso, spinulis parvis, erectis, planatis.*

Differs from L. Mac-Andrei in being longer, with the valves mucronated and rounded at the extremities, the posterior being hollowed out, and the rest much elevated, without conspicuous middle portion or lateral areas. The only perfect specimen found (on Acmæa fascicularis) displays no trace of solid scales. The account of the interior is taken from a large central and small anterior valve supposed to belong to this species from their agreement in other respects. *Long.* ·23, *lat.* ·13, *alt.* ·04.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 905 contains the perfect specimen off Acmæa, and the two valves.

Genus CHITON, *Linn.*

Chiton, pars, *auct.*—*H. & A. Ad. Gen.* vol. i. p. 474.—Acanthopleura, *Guild.*; *Gray* in *Proc. Zool. Soc.* 1847, p. 67.—Margin spinose: insertion-plates in terminal valve many-lobed, in middle valves bi-lobed.

257. Chiton flavescens, *n. s.*

Ch. t. ovatâ, valde depressâ (ad angulam 150°) flavidâ, aurantio maculatâ; valvis latis, marginibus subrotundatis, interstitiis curvatis, valde mucronatis; areis lateralibus et jugo indistinctioribus; mucrone parvo, superiore; totâ superficie granulis rugulosis confertim instructâ, haud punctulatâ; limbo pallii crasso, sublævi, ad marginem spinulis tenuibus, erectis, planatis instructâ; valvarum lobis, magnis, arcuatis, sinu maximo; marginibus valvarum intermediarum fissurâ duas in lobas divisis, quarum una parva, lineis punctorum utrâque in parte ad jugum decurrentibus; valvarum ultimarum marginibus subacutis, fissuris circiter x.

This is the least uncommon of the small Chitons, six specimens having been found of it. It is distinguished by its yellow colour, great depression, and small strong mantle margin without covering, except at the margin where a fine row of transparent flattened hairs may be seen. The smaller lobe on the margins of the inner valves is bounded by two rows of holes which proceed to the jugum. *Long.* ·16, *lat.* ·11, *alt.* ·3. Another specimen, rolled into a ball, is larger.

Hab.—Mazatlan; on shells, very rare; *L'pool Col.*

Tablet 906 contains the largest specimen; another in situ on a broken crevice of Crepidula; and 2 separate valves.

Genus ACANTHOCHITES, *Risso.*

Gray, Proc. Zool. Soc. 1847, p. 66: *H. & A. Ad. Gen.* vol. i. p. 482.—Chiton, pars, *auct.* Mantle with tufts of bristles.

258. Acanthochites Arragonites, *n. s.*

A. t. elongatâ, elevatâ (ad angulam 110°), pallido-fuscâ, olivaceo et roseo varie pictâ: valvis intermediis valde mucronatis, interstitiis a mucronibus valde divergentibus; jugo lato, pallido,

tenuissime longitudinaliter granulato-striato, transversim minutissime corrugato; areis lateralibus indistinctis; superficie totâ valde granulatâ, tuberculis sphæroidalibus et granulis catenatim in lineis a jugo subdivergentibus elegantissime instructâ; mucrone subconspicuo, subcentrali; intus roseâ seu albâ; marginibus acutis et lobis valvarum non separatis, magnis, fissurâ in utroque latere unâ, lobis angulatis, sinu maximo, planato; ad jugum tenuissime corrugatâ, ad mucronem laminatâ; valvâ posticâ hexagonali, duabus fissuris ad terminum divisâ; limbo pallii spiculis erectis translucidis copiose ornato; postice, antice, et ad suturas, spicularum quasi acicularum cristis pulcherrime munito.

Whether the varied colouring of this shell, its elegant sculpture, the bird-like form of the medial or hexagonal shape of the bifissured terminal valves, or the adornment of the mantle with transparent needle-like hairs, rising now in tufts, now in irregular crystals, be examined under the microscope, it would be difficult to find any shell of such surpassing beauty. Only one perfect specimen was found, but fresh valves belonging to several other individuals were detected among the Spondylus washings. The valves in the same shell greatly differ in colour, as in L. albolineatus. The posterior valve is peculiarly exquisite in its form, colour and sculpture. There is considerable variation in the size of the tubercles, and in the striation of the jugum. The outer margin does not enclose the plates of insertion, as it does in Lepidopleurus. *Long.* ·16, *lat.* ·06, *alt.* ·02.

Hab.—Mazatlan; off Spondylus calcifer; extremely rare; *L'pool Col.*

Tablet 907 contains the perfect specimen and 4 valves.

Family PATELLIDÆ.

Genus PATELLA, *Linn.*

As the shells in this genus can scarcely be distinguished from those of Acmæa, the location of many of the following species in this and the next family is doubtful.

259. Patella Mexicana, *Brod. & Sow.*

Zool. Journ. vol. iv, p. 369.—*Menke* in *Zeit. f. Mal.* 1851, p. 37, no. 132.

= Lottia gigantea, *B. M.*: *Gould* ms.

= Patella maxima, *B. M. Cat. D'Orb. Moll.* p. 53, no. 449.

Shell extremely large; white, or of a yellowish or greenish tinge, occasionally orange; with a broad marginal band of a semidiaphanous hue, very conspicuous in the young shell. Muscular scar in adult raised, irregularly lobed and corrugated. The outside is frequently covered with Algæ and bored by Lithophagi. Its surface is a favourite place of adherence for smaller limpets. In the young shell may be traced about 10 very indistinct principal ribs, with a profusion of radiating lirulæ. These however very soon disappear. The youngest ascertained specimen measures *long.* 1·65, *lat.* 1·4, *alt.* ·42.

The largest sp. „ „ 9·2, „ 6·9, „ 4·5.
A flatter do. „ „ 9·, „ 7·1, „ 3·6.

Hab.—Mazatlan, *Beechey's Voyage.*—Do., Menke.—Do.; abundant, *L'pool & Havre Coll.*—Monterey, *Col. Jewett,* (Gould *ms.*: non *Nutt.*)—Payta, Peru, *D'Orbigny.*

Tablet 908 contains 3 young sp. different ages.—909, 1 sp. finely grown, adolescent, margin flattened.—910, 1 do. margin sharp, muscular scar thick, brownish red.—911, the largest sp., outside riddled by Lithophagi.

260. PATELLA PEDICULUS, *Phil.*

Zeit. f. Mal. 1846, p. 21, no. 8.
=P. corrugata, *Rve. Conch. Ic.* sp. 132, pl. 40, f. 132, *a*, *b*. (1855.)
Comp. P. Araucana, *B. M. Cat. D'Orb. Moll.* p. 53, no. 448: (=however P. zebrina, var., teste *Gray* in loco.)

Shell normally flat, oblong, solid, with 10 stout rounded ribs projecting at the margins, of which 2 are in the axis of length with 4 on each side: ribs and interstices radiately striated: yellowish white, generally with more or less of black or brown tortoise-shell markings within, sometimes with the black between the ribs as described by *Phil.* and *Rve.* Sometimes the shell is more rounded and the ribs rather angular, in which state it might be taken for the young of P. Mexicana. Occasionally a few other intercalary ribs appear. In a very few unusually large specimens, the ribs are nearly obsolete at the margin and the shell is much lengthened. The body mark varies as usual; when plain, it is gathered into points as in P. discors. The very young shells appear not to develop the ribs marginally, in which state they might be taken for the young of P. discors. The stout ribs of the adult shell however bear no analogy with the very finely marked surface of the latter with its curiously puckered circum-umbonal portion. With the

young of P. Mexicana it has much closer analogies. The largest specimens of P. pediculus however do not at all run into the smallest of P. Mexicana. They have all the appearance of being old shells, with the margin narrow and the shape long and irregular; while P. Mexicana, as it is traced upwards, displays a very wide semitranslucent margin, and a broad regular shape, with the ribs not rounded and prominent but simply giving an angular form to the shell. To settle the point satisfactorily will require a series of P. Mexicana from its earliest stage, as well as a knowledge of the animals. Of this species I have carefully examined nearly 300 specimens. The youngest shell that has its ribs developed and clearly belongs to this species is ·17 long. Tablet 912 contains two smaller ones without distinct ribs, which probably belong to it. Even when very young, they are almost always incrusted with corallinous matter. The largest specimen measures *long.* 1·3, *lat.* 1·, *alt.* ·4. The ordinary size however is very much smaller. and flatter.

Hab.—Mazatlan, Philippi.—Acapulco, Reeve.—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 913 contains 3 young specimens.—914, 3 sp. ordinary state.—915, 3 do. ribs well developed.—916, 3 do. light tortoiseshell within.—917, 3 do. dark tortoiseshell.—918, 3 do. broad variety.—919, 4 do. ribs numerous.—920, 4 do. elongated, ribs small.—921, 1 sp. abnormally elongated, with very small ribs.—922, Patella discors, with place of attachment of P. pediculus.

261. PATELLA DISCORS, *Phil.*

Abbild. und Besch. Conch. pl. 2, f. 6.—*Rve. Conch. Ic.* sp. 78, pl. 29, f. 78, *a*, *b*.

The peculiar characteristic of this species, viz. the crumpling near the limbo, is very seldom seen without careful cleaning, as the shell is almost always thickly coated with vegetable corallinous deposits, algæ, &c. The surface is extremely finely ribbed throughout, but at a little distance from the black apex the shell is gathered into irregular undulations, about 15 (more or less) which soon disappear, and leave the shell henceforth of a regular growth. It goes through all the changes common to limpets, being sometimes high, sometimes depressed; sometimes suborbicular, generally oval. The margin is extremely finely crenated, and is generally more or less dotted with black. The prevailing colour is a greenish white, with more or less

distinct radiating black lines. Sometimes the internal surface is beautifully mottled with purple or brown. The animal mark is by no means constant in shape; but, when well defined, shews the body gathered pretty regularly into points with curves between. The smallest specimen is about ·25 in length; the largest measures *long.* 2·15, *lat.* 1·7, *alt.* ·72.

Hab.—Mazatlan, *Lieut. Shipley.*—S. W. Mexico, *P. P. C.*—Mazatlan very common; *L'pool & Havre Coll.*

Tablet 923 contains 4 sp. various ages.—924, 4 specimens white.—925, 5 do. greenish tinge.—926, 4 do. coloured within.—927, 4 do. tortoiseshell.—928, 8 sp. yellowish tinge.—929, 4 do. very faint appearance of marginal dots.—930, 7 do. a shade more developed.—931, 8 sp. black rays coated over.—932, 7 sp. black dots distinct.—933, 7 do. more distinct.—934, 7 do. well developed.—935, 5 sp. faint black dotted margin.—936, 5 do. distinct black margin.—937, 6 sp. with brown tortoiseshell markings.—938, 5 do. purplish tinge.—939, 4 do. black and brown.—940, 3 sp. body mark distinct.—941, 3 sp. margin abnormally indented.—942, 5 sp. irregular internal growth.—943, 1 do. with large Balanus, Lithophagus, &c.

Genus NACELLA, *Schum.*

Patella, pars, *auct.*

262. Nacella, ————, *sp. ind.*

Tablet 944 contains a solitary specimen of a Nacella, of the shape and size of Ancylus fluviatilis, with the apex spirally recurved, and of a dark horny colour. It is not perfect enough for description.

Hab.—Mazatlan; off Chama, 1 sp.; *L'pool Col.*

Family ACMÆIDÆ.

Genus ACMÆA, *Esch.*

Eschscholtz Zool. Atl. ed. *Rathke*, 1833, p. 16, (diagnosi copiosa.)—*Forbes & Hanl. Br. Moll.* vol. ii. p. 434.—*Woodw. Man. Moll.* p. 155.—*Phil. Handb. Conch.* p. 199. (Non Acme, *Hartm.* 1821.)

Lottia, *Gray* in *Phil. Trans.* 1833, and in *Sow. Gen.* 1833.

Patelloida, *Quoy & Gaim.* 1834, *Voy. Astr.* vol. iii. p. 349.

Tectura, *Audouin & Milne Edw. Ann. Sc. Nat.* 1830, vol. xxi. p. 226, (*Gray*: p. 325, *Phil.*)—*H. & A. Ad. Gen.* vol. i. p. 458.

263. ACMÆA MESOLEUCA, *Mke.**

A. t. "*Acmæis patinæ et testudinali*" *simili; tenui, subdiaphanâ, rarius solidiore: extus, apicem versus lævi, postea lirulis tenuibus subdistantibus irregularibus ornatâ, sæpe minutissime granulatis, interdum crassioribus, appropinquantibus; fusco-olivaceâ, interdum fuscâ, rarius nigro-fuscâ; varie tessellatâ, lineatâ seu maculatâ, interdum unicolore: intus, margine fusco et albido, seu nigro-fusco; mèdio plus minusve viridi, seu albido-viridi, interdum flavescente seu flavido-viridi; spathulâ fuscâ, seu fusco-olivaceâ, capite subtriangulâri, corpore interdum irregulariter pectinato.*

Mke. in *Zeit. f. Mal.* 1851, p. 38, no. 135, (diagn. supra auct.)

? + A. mutabilis, pars, *Mke. loc. cit.* p. 37, no. 133.

= Patella diaphana, *Rve. Conch. Ic.* pl. 24, sp. 61, f. 61, *a*, *b*, 1854.

? = Patella diaphana, *Nutt.* in *Jay's Cat.* no. 2813, (sine diagn.)

? = Lottia patina? *C. B. Ad. Pan. Shells*, p. 241, no. 367 (non A. patina, *Esch.*)

Pars ? = Patella (Acmæa?) personoides, *Midd. Mal. Ros.* pt. ii. p. 37, no. 10, pl. 1, f. 2, 1849:—(= A. ancyloides, *Mid*, olim, non Propilidium ancyloide, *Förbes.*)

Var. ? = Patella (Acmæa?) æruginosa, *Mid. Bul. Acad. St. Pet.* vol. vi. no. 20:—*Mal. Ros.* pt, ii. p. 38, no. 11, pl. 1, f. 1.

= Lottia pintadina (pars) *Gould Exp. Shells*, 1846, p. 9.

Comp. Patella floccata, *Rve. Conch. Ic.*

„ „ vespertina, *Rve.* loc. cit. pl. 26, f. 67, *a*, *b*.

„ „ Cumingii, *Rve.* loc. cit. pl. 16, f. 37, *a*, *b*.

Var. = Patella striata, *Rve.* loc. cit. pl. 33, f. 99, *a*, *b*.: (non Patelloida striata, *Quoy & Gaim. Voy. Astr. Moll.* pl. 71, f. 8—11:—*Rve. Conch. Ic.* sp. 58.)

= Acmæa Antillarum, *P. P. C. Cat. prim.*: non *Sow.* (= A. testudinalis, teste *Gould Inv. Mass.*)

= Acmæa patina, *P. P. C. Cat. prov.* (non *Esch.*)

* It is difficult to say which name should be retained for this species. It is figured as P. diaphana by Reeve, the name having been received by Mr. Cuming from Jay as of Nuttall. Mr. Nuttall's own specimens however of the green limpet are from Mazatlan, nor does he remember taking them in California; and it is probable that he gave the name to the parallel variety of A. patina, to which the green shells brought by Hinds, Kellett, &c. were affiliated. At any rate it can only claim priority from the date of its appearance in Reeve. Gould's name would have been retained, but that unfortunately his type specimens consist of P. verriculata, leucophæa and scabra, *Rve.*, with A. mesoleuca and fascicularis, *Mke.* If one or both of Middendorff's species should prove identical with the Mazatlan species, the name A. personoides should be retained: but even that author's very copious descriptions do not allow us to speak with confidence, without a comparison of types. Under these circumstances, as Menke's name, though given later, certainly represents the Mazatlan species in its usual state, it is thought best to retain it.

This species, and its more temperate analogue, A. patina, go through the same varieties of form and pattern; some of which are so divergent that it is not to be wondered at that they have been described as distinct; and others are so marvelously alike that they can scarcely be separated from each other by figure or description. The habit however of the two species is sufficiently distinct; and those who have examined large multitudes of specimens will have little difficulty in separating them. The simplest guide is the prevailing green and brown colour of this species, and the prevailing white and black of the other. The character of the ribs, which is mainly relied upon by Middendorff, appears subject to great variation.

Shell extremely variable in colour and markings, but generally rather broad and flat, with the apex somewhat inclined anteriorly, especially in the young shell. Outside with the apex and sometimes a considerable portion of the shell nearly smooth; generally with extremely fine ribs, sometimes sharp, sometimes rounded, generally slightly granulose; sometimes with broad strong ribs; sometimes nearly smooth with radiating lines of granules. Sometimes intercalary ribs are found, much larger than the rest; sometimes different plans of sculpture are seen on the same shell. The colour outside is generally olive or brownish green; sometimes without markings, generally with white lines either radiating or broken up; often with white patches tessellating with the brown; or changing from one pattern to another. Inside the shell is generally whitish about the middle, (whence the name,) with more or less of a bluish green tinge, sometimes dark green, sometimes brownish, sometimes with an element of ochre yellow more or less mottled, (? P. æruginosa, *Mid.*) There is almost always a large dark spot at the body mark, of a brownish olive green, in which sometimes the brown, sometimes the dark green predominates. The body stain is irregularly and slightly gathered into points; the head mark is generally shewn by a stain shaped like a sector, bounded by two radii from the apex, about 70° apart. The margin is generally broad, occasionally very narrow, bounded inside by a greenish line; ordinarily tessellated with brown and white, sometimes with green or yellow; not unfrequently with very slight markings of white, or none at all; in which case the colour is either dark greenish brown, (P. striata, *Rve.* sp. 69, non *Quoy*, sp. 58), or with intermediate stages to very light greenish white. That all the shells here classed together belong to the same species, I have not the

slightest doubt, having carefully examined about 11,000 specimens, from which those here enumerated were selected by a carefully repeated process of reduction and comparison. No very young shells were found; the youngest measuring ·5 in. in length; the largest, *long.* 1·56, *lat.* 1·33, *alt.* ·39.

Hab.—Mazatlan; in extreme profusion; *L'pool & Havre Coll.*—Central America, *Cuming, Hinds, Kellatt.*—? Panama; on and under stones at neap tide low water mark, rare; *C. B. Adams.*—(A. æruginosa, *Mid.* non *Rve. Conch. Ic.* pl. 16, sp. 38) Bodejas, *Wosnesseaski.*—(A. striata, *Rve.*) Gallapagos, *Cuming.*—(A. personoides) Kenai Bay, *Wosnessenski.*

Tablet 945 contains 28 specimens in the normal state, outside striped, with a prevailing greenish tinge, and regularly tessellated margin.—946, 26 sp. do. outside tessellated.—947, 27 sp. do. prevailing brownish tinge; more often worn outside.—948, 5 sp. the same, tessellated.—949, 12 sp. yellowish ground; broad streaks of brown.—950, 6 sp. do. narrow streaks.—951, 6 sp. do. scarcely rayed.—952, 12 sp. do. tessellated.—953, 4 do. greenish tinge.—954, 6 sp. border with broad patches of dark, narrow of light, green inside; yellow ground.—955, 6 sp. do. light ground.—956, 6 sp. do. tessellated.—957, 6 sp. brownish.—958, 8 sp. broad dark margin, interrupted by narrow light rays; brownish cast.—959, 10 sp. green cast.—960, 4 sp. light border; brown, finely rayed with white.—961, 9 sp. do. faintly mottled.—962, 2 sp. do. with purplish tinge.—963, 8 sp. do. with narrow brown dotted edge.—964, 9 sp. do. green tinge, mottled with brown.—965, 4 sp. do. green margin, scarcely tipped with brown.—966, 4 sp. do. very light.—967, 1 sp. do. nearly white.—968, 4 sp. do. with dark brown edge.—969, 8 sp. margin nearly uniform; dark, with a few white rays.—970, 8 sp. do. scarcely mottled with white.—971, 12 sp. do. lighter tint.—972, 9 sp. margin uniform, (= P. striata, jun. *Rve.* not *Quoy,*) dark green.—973, 11 sp. do. intermediate.—974, 9 sp. brown.—975, 8 sp. of distorted growth; of which one has made a series of raised laminæ, another a fresh margin greatly contracted.—976, 5 sp. shewing the exterior; tessellated.—977, 7 sp. do. abounding in white.—978, 3 sp. do. striped—979, 4 sp. do. pattern changing.—980, 4 do. dark green var.—In all 301 specimens, of which no two are exactly alike.

264. ACMÆA FASCICULARIS, *Mke.*

Zeit. f. Mal. 1851, p. 38, no. 134.

+ Acmæa mutabilis (pars quidem jun.), *Zeit. f. Mal.* 1851, p. 37, no. 133.

May 1856.

=Patella opea, teste *Rve.*: non *Nutt.*, in *Rve. Conch. Ic.* sp. 79, pl. 29, f. 79, *a*, *b*. (Sandwich Isl.)
Var.=P. discors, jun. *P. P. C. Cat. prim.*
The following W. Indian species in the Br. Mus. are closely analogous: Lottia lineata, Tranquebarica, and pulcherrima, *(Guilding.)*

The exquisite beauty of this "most lovely species" (as Menke deservedly calls it), both for the shading of the colours and the delicacy of the penciling, cannot be described. The prevailing tints are a reddish brown outside, more or less mottled or striped with white; inside a prevailing white, more or less penciled or fretted with brown, and a border, sometimes white with a tessellated penciling of brown; sometimes a delicate fawn shading into a pinkish or slightly greenish tinge, with or without penciling. The body mark is of a dark lustrous brown, or very light with a greenish tinge, or nearly absent. It is large for the size of the shell, more or less removed from the margin. The young shells of A. mutabilis, *Mke.* are a variety of this species; which I unfortunately distributed at first as the young of P. discors, with which it has really no connection. The colourless and worn shells of A. mesoleuca and A. fascicularis are very like each other; but as their general habits are very distinct, it is necessary to keep them apart. In shape, A. fascicularis is much longer, and generally considerably smaller. The standard colour of A. mesoleuca is green, of A. fascicularis red. In A. mesoleuca the markings are laid on with stripes and patches, in A. fascicularis with very fine pencilings. In the latter, the outline of the body mark is much more regularly gathered up into points with concave margins between, the points often making regular lines radiating from the centre. The surface of A. mesoleuca is covered with granulose ribs with smooth interstices and a very thin smooth epidermis; that of A. fascicularis is very much more finely marked, shewing under the glass smooth ribs with the interstices extremely finely cancellated with very close slightly rugose concentric striæ, covered with an extremely thin rather velvety epidermis. The surface of A. fascicularis is much more generally abraded; and as the young shells were not uncommon in the Spondylus and Chama washings, while not one was found of A. mesoleuca, it is presumed that their station is different. The apex is sometimes brown, sometimes white; and in the smallest specimen, ·035 by ·025, shews no trace of being spirally recurved. The young

shells are known by their finely cancellated texture and delicate reddish penciling; and generally, by a white spot proceeding from the apex posteriorly bounded by red lines. In all stages it is thin, and very glossy within. The largest specimen measures *long.* 1·34, *lat.* 1·04, *alt.* ·33.

Hab.—Mazatlan, Menke.—Do.; not uncommon; *L'pool Col.*—San Diego; *Lieut. Green.*

Tablet 981 contains 12 specimens, extremely young, whitish.—982, 8 sp. do. reddish.—983, 4 sp. do. much compressed at the sides; but, as they agree in colour and markings, they are probably only a variety.—984, 5 sp. light margin; scarcely touched with penciling.—985, 5 sp. do. very slight posterior pencilings.—986, 5 sp. do. margin fawn coloured.—987, 5 sp. do. greenish tinge.—988, 4 do. purplish brown.—989, 5 sp. pencilings more distinct.—990, 6 sp. with faint dots all round.—991, 8 sp. do. darker margin.—992, 8 sp. do. still darker.—993, 4 sp. do. very narrow margin.—994, 3 sp. penciling regular; slight and shaded.—995, 4 sp. do. white border, penciling in single rays.—996, 8 sp. do. penciling fretted, rays distinct.—997, 7 sp. do. margin coloured.—998, 7 sp. penciling interlaced, reddish margin.—999, 7 sp. do. margin dark with penciling.—1000, 9 sp. do. margin very dark, interior white.—1001, 5 sp. do. penciling visible within.—1002, 3 sp. distorted growth.—1003, 6 sp. shewing exterior, rayed.—1004, 4 do. very slightly.—1005, 3 do. uniform red.—1006, 1 do. with light ring.—In all 146 specimens, of which no two are exactly alike.

265. ACMÆA PATINA, *Esch.*

Eschscholtz Zool. Atl. ed. *Rathke,* 1831, p. 19, pl. 24, f. 7, 8.—*Mid. Bul. Ac. St. Pet.* vol. vi. no. 20:—*Sib. Reise,* p. 187, pl. 16, f. 1 *a-d*, 2 *a-c*, 3.

+A. scutum, *Esch.* loc. cit. p. 19, pl. 23, f. 1—3; teste *Mid.* loc. cit. et *Phil.* in *Zeit. f. Mal.* 1846, p. 107.—*? D'Orb. Voy. Am. Mer.* p. 479 (excl. fig.)

=Patella mammillata, *Nutt.* in *Jay's Cat.* no. 2839:—*Rve. Conch. Ic.* pl. 42, f. 140, *a*, *b*.

+Patella tessellata, *Nutt.* in *Jay's Cat.* no. 2885.

+Jun. Patella fenestrata, *Nutt.* in *Jay's Cat.* no. 2815.:—*Rve. Conch. Ic.* pl. 38, f. 121, *a*, *b*.

+Patella verriculata, *Rve. Conch. Ic.* pl. 31, f. 87, *a*, *b*.

+Patella cinis, *Rve. Conch. Ic.* pl. 24, f. 60, *a*, *b*, *c*.

? + Patella Nuttalliana, *Rve. Conch. Ic.* pl. 30, f. 81, *a*, *b*.
? + Patella Cumingii, *Rve. Conch. Ic.* pl. 16, f. 37, *a*, *b*.—(Valparaiso, *Cuming.*)
? + Patella diaphana, *Nutt.* non *Rve.* (v. supra, p. 203.)
= Lottia pintadina, (pars,) *Gould*, loc. cit. in p. 203.
Comp. Patella clypeater, *Rve.* (as of *Less. Voy. Coq.* p. 419) *Conch. Ic.*, pl. 16, f. 37, *a*, *b*. (Valparaiso, *Cuming.*)

I have the authority of Mr. Nuttall, after a careful collation of his specimens and those of Dr. Gould, for placing together his species above quoted. The ordinary form of the shell greatly resembles A. mesoleuca, but without the green tinge. The pattern, which distinguishes many of the above species, often changes in the same shell. Whether the shells of N. and S. America are the same, is not yet decided. The extreme form is a large solid white shell, with a broad black rim. To this belong the only two specimens found in the Mazatlan collection. Mr. Reeve, who most obligingly named the Mazatlan limpets according to his monograph, affiliated these, and some of the dark-margined specimens of A. mesoleuca as their young, to P. striata, *Quoy & Gaim.* Their species is different; but the young are most probably his own P. striata, sp. 99, from the Gallapagos. The A. scutum of *Esch.* is quite different from the large flat shell with a rich metallic lustre, which often goes by that name in collections; this occurred in abundance at S. W. Mexico, *P. P. C.*, and is from Monterey, *Mus. Cum.*—The largest Mazatlan specimen measures *long.* 1·5, *lat.* 1·23, *alt.* ·57.

Hab.—Sitcha, *Eschscholtz*, *Wosnessenski.*—Kenai Bay, *do.*—Aleutian Is., Unalashka, *Kastaljski.*—Tugur Bay, Schantar Is., *Middendorff.*—California, passim, *Nuttall.*—Monterey, San Diego, *Lieut. Green.*—Mazatlan; 2 fresh sp.; *L'pool Col.*—(?) Chili, Bolivia, Peru, *D'Orbigny.*

Tablet 1007 contains the most characteristic specimen.

266. Acmæa persona, *Esch.*

Esch. Zool. Atl. p. 20, pl. 24, f. 1, 2.—*Mid. Mal. Ros.* pt. ii. p. 36, pl. 1, f. 3.
+ Jun. = A. radiata, *Esch.* loc. cit., p. 20, no. 8, (teste *Mid.**)
+ A. ancylus, *Esch.* loc. cit. p. 20, no. 10, pl. 24, f. 4 bis, 6. (do.)

* Philippi however (loc. cit. supra) regards A. radiata and A. ancylus as forming a different species not from N. America, but from Chili.

=A. scutum *D'Orb.* loc. cit. pl. 64, f. 8—10, excl. diagn. (teste *Mid.*)
?=Lottia punctata, *Gray*; (non *Quoy & Gaim.*) teste *Mid.*
=P. Oregona, *Nutt.* in *Jay's Cat.* no. 2852:—*Rve. Conch. Ic.* pl. 36, f. 112, *a*, *b*.
+P. umbonata, *Nutt.* loc. cit. no. 2887:—*Rve.* loc. cit. pl. 35, f. 107, *ab*.
+P. pileata, *Nutt.* loc. cit. no. 2861.

This species is known by its comparatively small size, compressed sides, and recurved apex. The front part is sometimes covered with stout, rounded ribs, sometimes with a very few fine and separate ones, and sometimes nearly smooth. It is either uniform in tint, or is minutely spotted outside; inside white and blackish brown. The solitary Mazatlan specimen has broad, rounded ribs, and a somewhat shagreened surface; and measures *long.* ·96, *lat.* ·8, *alt.* ·42.

Hab.—Sitcha, *Eschscholtz.*—Mouth of Columbia River, *Nuttall.*—Sta Barbara, *Col. Jewett.*—San Diego, *Lieut. Green.*—Mazatlan; 1 fresh sp.; *L'pool Col.*

Tablet 1008 contains the specimen.

267. ACMÆA SCABRA, *Nutt.*

Jay's Cat. no. 2907.—*Rve. Conch. Ic.* sp. 119, pl. 37, f. 119, *a*, *b*.
Non Patella (Lottia) scabra *Gould Exp. Shells*, p. 10:—
=Patella spectrum, *Nutt.* in *Jay's Cat.* no. 2877:—*Rve.* loc. cit. pl. 29, f. 76, *a*, *b*.

Although the name of Gould was published with description before that of Nuttall, yet I have presumed upon the known courtesy of Dr. Gould, in order to avoid re-naming a species which has been widely distributed in collections, and which (as well as Dr. Gould's A. scabra, under the name of P. spectrum) has been figured in the Conch. Ic. This shell occurred unnamed in Dr. Gould's collections. It frequents the temperate portion of the coast, and is easily recognized by its light flesh colour, and tubercular rasp-like surface. *Long.* 1·06, *lat.* ·9, *alt.* ·4.

Hab.—California, *Nuttall.*—Monterey and Sta Barbara, *Col. Jewett.*—Mazatlan; 1 sp. only; *L'pool Col.*—S. W. Mexico; 1 sp. *P. P. C.*

Tablet 1009 contains the specimen.

268. ACMÆA MITELLA, *Menke.*

Zeit. f. Mal. 1847, p. 187, no. 43.
=Patella navicula, *Rve. Conch. Ic.* sp. 130, pl. 40, f. 130, *a*, *b*.

This shell having been first named from a single worn specimen, the minute details of Menke are not generally applicable. The description in the *Conch. Ic.* applies to a larger number, but not to the whole. Shell small, strong, conical, almost exactly resembling a common Barbadoes species (?=P. leucopleura, *B. M. Cat. Sagr. Cub. Moll.* p. 34, no. 404); outside either very finely or coarsely ribbed, with or without granules, generally eroded or encrusted; inside white, blackish brown, tortoiseshell or light chesnut, often with a greenish tinge; margin generally with a row of black dots, more or less conspicuously connected with the apex (especially in young shells), sometimes coalescing into a black rim, rarely wholly absent. Margin sometimes finely crenulated by the projecting ribs, sometimes almost entire. Animal mark irregularly and slightly gathered up into points. It either excavates a hollow for itself on other shells, or keeps its ground clear while the coralline grows up round it. Its small size and shape are not the result of the accidents of its position,* as it is generally found where it has plenty of room to grow larger if it chooses.

The smallest specimen measures *long.* ·05, *lat.* ·03, *alt.* ·015.
A flat „ „ „ ·48, „ ·35, „ ·17.
A conical „ „ „ ·51, „ ·39, „ ·34.

Hab.—Mazatlan, *Lieut. Shipley*, Mus. Cum.:—do. *Melchers*, Menke:—do,; not uncommon; *L'pool Col.*

Tablet 1010 contains 5 specimens very young.—1011, 17 young shells, each varying in colour, &c.—1012, 30 specimens, of which no two are coloured exactly alike.—1013, 4 specimens shewing external variations.—1014, a specimen in situ on Fissurella; also Patella discors with attachment marks.—1015, a gigantic specimen, if of this species as is probable, measuring *long.* ·93, *lat.* ·71, *alt.* ·41.

GENUS SCUTELLINA, *Gray.*

Scutellina, *Proc. Zool. Soc.* 1847, p. 168, no. 405.
Scutella, pars, *Brod. Proc. Zool. Soc.* 1834, p. 47: non *Lam.*
Patella, pars, *auct.*

* Dr. Gray, when first examining this collection, expressed the opinion that P. Mexicana, P. discors, A. mesoleuca, A. fascicularis and A. mitella, might be varieties of the same species, according to station, food, &c.

?Pars = Pilidium, *Forbes & Hanl.* = Jothia, *Phil. Handb. Conch.* p. 200 : = Iothia, *Gray* in *Mrs. Gray's Fig. Moll. An.* p. 93 : *H. & A. Ad. Gen.* vol. i. p. 461 : non *Forbes, Athen.* 1849, (= Lottia, err. typ.) teste *Woodw.*

This genus is a part of the Scutella of Brod. (the remainder constituting the genus Broderipia, *Gray*, of the family Stomatellinæ,) of which the name was altered to Scutellina by Dr. Gray in consequence of its preoccupation by Lam. for a genus of Echinoderms.

269. SCUTELLINA NAVICELLOÏDES, *n. s.*

S. t. oblongâ, lateribus subplanatis, valde inæquilateruli ; apice terminali, sed a margine remoto ; tenui, subdiaphanâ, albidâ, epidermide tenuissimâ cinereâ indutâ ; liris exillimis radiantibus et concentricis, subæqualibus, creberrimis, confertim decussatâ, ad intersectiones subnodosis ; interstitiis quadratis ; margine a liris radiantibus vix crenulato ; columellâ (ut in "Navicellâ") planatâ, arcuatâ.

One specimen only of this beautiful and very distinct species was found by Mr. Darbishire : the apex was unfortunately broken, in detaching the shell from extraneous matter, but its place is nearly determined by the sculpture. The margin is concave ; the shell resting on its anterior and posterior extremities. *Long.* ·22, *lat.* ·14, *alt.* ·06.

Hab.—Mazatlan ; 1 fresh sp. from burrow of Lithodomus, in Spondylus calcifer ; *L'pool Col.*

Tablet 1016 contains the specimen, presented by R. D. Darbishire, Esq.

FAMILY GADINIADÆ.

This family was placed among the Pulmobranchiata, next to Siphonariadæ, when the animal was only known by Adanson's notice, *Gray*, 1847 : in the same company, between Cæcum and Acmæa, by *Philippi*, 1853 : next the Patellidæ, after Philippi had published a description of the animal, by *Gray*, 1850, and *H. & A. Adams*, 1854. The animal is gill-bearing, while that of Siphonaria is pulmonated. The shell has no interruption in the muscular scar for the slit, which is at the left of the head, and generally very small.

Genus GADINIA, *Gray*.

Phil. Mag. & Journ. 1824, p. 63:—*Phil. Handb. Conch.* p. 199.—*H. & A. Ad. Gen.* vol. i. p. 463.
Mouretia, *Sow. Proc. Zool. Soc.* 1835, p. 6;—*Zool. Beech. Voy.* p. 147.
Pileopsis and Patella, sp. *auct.*

270. Gadinia pentegoniostoma, *Sow.*

G. t. plus minusve conicâ, seu valde depressâ, albâ; subcirculari, seu irregulariter varie angulatâ; apice subcentrali, in adultâ detrito, in juniore spirali, anfractibus planorbiformibus, adversum cervicem lateraliter affixo; costis plurimis radiantibus, angustis, rotundatis, valde extantibus, interstitiis subæquantibus; margine costis productis, cavatis, subdiaphanis; canali minimâ, ad marginem haud extante; cicatrice musculari dextrorsum integro, sinistrorsum irregulariter lobato. Animal cavitatem corrodente.

Siphonaria pentegoniostoma, *Sow.* ? ubi.

Having met with no description of this shell, the name of which is likely to mislead, I have drawn out a diagnosis from a comparison of several hundred specimens. Most of the shells are very irregular in growth, apparently crowding each other and forcing their bodies into angular shapes: but the normal condition appears to be nearly round, with semi-transparent, hollowed, projecting ribs. The muscular scar, on the opposite side from the slit, is irregularly divided into lobes. The muscle of attachment appears very strong, the shell being generally broken in removal; and on the place of adhesion (which is eaten away) is generally seen a black circular ring. No very young specimens were found, to compare with those of Siphonaria: but on the smallest, ·23 in length, is just discernible a small planorbiform apex, turned to one side, away from the head; in this respect agreeing with Siphonaria and differing from Patella. The ribs are of nearly equal size, there being no large one to receive the canal, as in Siphonaria. The shell often begins very conical, and suddenly becomes flat. A regularly grown up sp. measures *long.* ·68, *lat.* ·63, *alt.* ·18.
The largest sp. „ „ ·98, „ ·88, „ ·43.
A flattened sp. „ „ ·67, „ ·53, „ ·16.

Hab.—Mazatlan; gregarious, often adhering to each other, not common; *L'pool Col.*

Tablet 1017 contains 3 sp. finely grown.—1018, 3 do. usual state.—1019, 3 do. irregularly grown.—1020, 6 sp.; one with 5 corners, another with 4, another with 3, another with 2, another with 1, the other circular.—1021, 2 sp. very deformed growth.—1022, 2 do., one with double margin, the other extremely depressed.—1023, 1 sp. with dead Balani, enclosing a Crustacean.

Family FISSURELLIDÆ.

Genus FISSURELLA, *Brug.*

The Mazatlan Fissurellæ naturally divide themselves into two sections; the first with the surface irregular, and the margin not crenulated except by the projecting ribs; the second with the surface cancellated, the margin crenulated, the apex in the young shell prominent and recurved, the callus frequently truncated, sometimes laminated. In the first, the Rimuloid stage must be of very short duration, as extremely young shells were found, of the same form as the adult: in the second, this stage continues for a comparatively long period, as may be observed in the English species, as well as in the specimens here recorded. To the latter group H. & A. Adams *(Gen.* i. 447) have unfortunately given the name of Lucapina, as of Gray. The animal however of Gray's typical species, L. crenulata *(Fig. Moll. An.* p. 92, no. 159), is described by Nuttall as like that of Parmaphorus, extremely large, and completely enveloping the shell.—The shape and markings, which in most species are tolerably constant, are in others very variable: even the form of the aperture and callus is in some instances remarkably changeable.

Section A. *Margin interrupted by ribs.*

271. Fissurella virescens, *Sow.*

Proc. Zool. Soc. 1834, p. 125.—*Müll. Syn. Nov. Test. Viv.* p. 154.—*Sow. Conch. Ill.* sp. 31, f. 37 (quasi F. coarctata, *King.*)—*Rve. Conch. Ic.* pl. 4, f. 12, sp. 12.—*Mke. Zeit. f. Mal.* 1851, p. 36, no. 130.—*C. B. Ad. Pan. Shells,* p. 238, no. 361.—*H. & A. Ad. Gen.* i. 446.

This species scarcely differs from F. nigropunctata, *Sow.* except in the entire absence of black dots round the margin. Shell with very numerous fine ribs, with still finer ones between, sometimes slightly nodulous. Outline more or less oval, more or less conic; growth regular. Hole large, subcentral, deeply chiseled, oval, constricted in the middle externally, where it is bilobed. Colour olive green, often stained with red when polished. Surface frequently eroded. Interior from pale to dark green; margin crenated by the ribs; callus rather thick, radiately corrugated, not bounded by a dark line. Muscular impression distinct. The young shells (which were very rare) are shaped like the adult, with the hole even larger in proportion. The largest sp. measures *long.* 2·2, *lat.* 1·66, *alt.* ·8.

An elongated sp.	,,	,,	1·7,	,, 1·22,	,, ·65.
A flattened sp.	,,	,,	1·95,	,, 1·48,	,, ·62.
A rounded sp.	,,	,,	1·75,	,, 1·49,	,, ·67.
A conical sp.	,,	,,	1·75,	,, 1·34,	,, ·77.
The smallest sp.	,,	,,	·8,	,, ·56,	,, ·2,

with a hole ·13 by ·08.—*Div.* 100°—120°.

Hab.—Panama; in exposed situations at low water; *Cuming.*—Do.; common, on a ledge of rather smooth rocks, between half tide and low water mark, in a place somewhat exposed to the sea; *C. B. Adams.* Mazatlan; very common; *L'pool Col.*

Tablet 1024 contains 10 sp., various ages, normal state,—1025, 4 do., elongated form.—1026, 4 do. flattened form.—1027, 3 do. rounded form.—1028, 2 do. conical.—1029, 2 do. ribs strong.—1030, 2 do. ribs faint.

Tablet 1031 contains 2 sp. surface cleaned, shewing red tint beneath.—1032, 5 sp. shewing shades of colour within.—1033, 2 sp. diseased from worms, &c.—1034, 1 sp. hole irregular through accidental breakage.

Tablet 1035 contains a remarkable monstrosity with 2 holes. The first is in all respects normal. The second is adjacent anteriorly, perfectly round, with a thick callus within, united to that of the normal hole posteriorly, anteriorly rather pointed.*

* A similar monstrosity appears in a specimen of F. ornata in Mr. Nuttall's collection. The shell is abnormally conical, with the hole nearly round instead of oblong, bilobed. The second hole commences 3-5ths down towards the anterior margin, is very minute, and finds its exit close to the other at the apex. It is surrounded by a thick callus. A still more remarkable monstrosity, without a hole at all, exists in D'Orbigny's Col. v. *B. M. Cat. D'Orb. Moll.* p. 51, no. 436.

Tablet 1036 contains a sp. with the hole not constricted in the middle.

Tablet 1037 contains a sp. with a circular hole. Nodulous ribs strong. Inside white within the muscular scar, and at the margin. In other respects like the typical form. It would have passed for a distinct species, but for the intermediate form quoted above; and closely resembles F. Barbadensis.

[272. FISSURELLA BARBADENSIS, *Gmel.*

Patella Barbadensis, *Gmel.* p. 3729, no. 199: + P. perforata, *Gmel.* p. 3730, no. 202: + P. porphyrozonias, *Gmel.* p. 3730; *Dillw.* p. 1061, no. 102: + P. rosea, *Gmel.* p. 3730; teste *B. M. Cat. Cub. Moll.* p. 33, no. 400.

Patella perforata, *Dillw. Descr. Cat.* p. 1558, no. 95.

Fissurella Barbadensis, *Lam. An. s. Vert.* vol. vii. p. 595, no. 9: et *auct.*

Cremides Barbadensis, *H. & A. Ad. Gen.* i. 446.

One small specimen of this well known West Indian species was found, which might have been taken for an extreme variety of F. rugosa, were it not for an abundance of the Spiroglyphus, and a trace of the red coral, both of which are characteristic of the Atlantic ocean, and are entirely absent from the genuine Mazatlan shells. It is perfectly fresh, and probably came over on a pebble as ballast.

Hab.—Cuba, *Sagra.*—Barbadoes, Lamarck et auct.—Mazatlan; 1 small specimen, ? imported in ballast; *L'pool Col.*

Tablet 1038 contains the specimen.]

273. FISSURELLA RUGOSA, *Sow.*

F. t. maxime variante; plerumque costis plus minusve æqualibus, interdum nodulosis, interdum quibusdam alteras maxime superantibus; margine valde irregulari, interdum ovali, interdum elongato, plerumque antice angulato, a costis plus minusve crenato; aperturâ haud centrali; seu subcirculari, ovatâ; seu oblongâ, medio constrictâ; seu bilobatâ; seu trilobatâ; seu lineari, ad extremitates lobatâ: callositate plus minusve extante, seu concolore, seu lineâ purpureâ cinctâ; superficie externâ rubro-olivaceâ, seu rubrâ, seu cinereâ; internâ virescente, interdum rubro plus minusve maculatâ; formâ plerumque planatâ, interdum subconicâ.

Conch. Ill. sp. 66, f. 54.—*Rve. Conch. Icon.* pl. 8, f. 56. (Diagn. auct.)

Cremides rugosa, *H. & A. Ad. Gen.* i. 416.
+ Fissurella chlorotrema, *Mke. Zeit. f. Mal.* 1847, p. 186, no. 40.
Fissurella humilis, *Mke. loc. cit.* no. 41.
? + F. viminea, *Mke. Zeit. f. Mal.* 1851, p. 36, no. 131 (non *Rve.*)
= Fissurella virescens, jun. *P. P. C. Cat. Prov.*

It is not to be wondered at that Menke did not find any figure in the *Conch. Ill.* answering to his shells; as the species was described from not very characteristic specimens of a rare and extreme form of this very variable shell. Although placed by H. & A. Ad. in a different subgenus from F. virescens, some forms run so closely into the young of that species, that it was only after repeated examinations of some thousands of specimens, and the fortunate discovery of a very few of the real F. virescens, *jun.* that I felt justified in separating them. The chief differences are, (1) that F. virescens is of a very regular, F. rugosa very irregular habit of growth:—(2) that F. rugosa is much smaller, and never has the hole central, though the amount of inequality is very variable:—(3) that the hole of F. virescens is always much larger in proportion. The station also appears different, as F. rugosa is very frequently entirely covered with algæ, and seldom rubbed; while F. virescens is generally rubbed; and only one (doubtful) specimen was found with algæ. In the ordinary growth of the shell, the ribs are not much more unequal than in F. virescens. The most remarkable feature in the species is the great variation in the shape of the hole; in this respect resembling F. ornata, *Nutt.* and F. macrotrema, *Sow.* The extreme forms however pass into each other by such insensible gradations, that it is scarcely possible to regard them as otherwise than one species. The youngest specimen, though only ·035 in length, with a well formed suboval hole, has no spiral vertex; there is however a scar where it may have adhered.* In a larger specimen, ·11 in length, the shell is formed as in the adult, light red, with an oval hole. The largest specimen measures *long.* 1·45, *lat.* ·97, *alt.* 28.

A broad specimen	„ „	1·18, „ ·87,	„ ·34.
A conical specimen	„ „	·92, „ ·62,	„ ·3.
A flat sp. (shape resembling Clypidella)		·74, „ ·53,	„ ·11.
An elongated sp.	„ „	1·03, „ ·56.	„ ·24.

Holes, ·08 by ·06; 13 by ·04. *Div.* 130°—160°.

* If further investigation should prove that the apex of these species is deciduous, while in the next section it is persistent until it becomes absorbed in the progress of the hole, it will form a remarkable character of separation between the groups.

Hab.—Gallapagos Is., *Cuming.*—Mazatlan; not uncommon, frequently growing on uneven surfaces, and often covered with algæ; *L'pool Col.*

Tablet 1039 contains the two youngest specimens.

Tablet 1040 contains 3 sp. smooth growth, hole oval.—1041, 3 do. regular form, hole with medial constriction.—1042, 3 do. elongated growth.—1043, 2 do. hole trilobed.—1044, 1 do. hole elongated, lobed at each end.

Tablet 1045 contains 3 sp. rough growth, hole rounded oval.—1046, 3 do. hole elongated oval.—1047, 3 do. with medial constriction.—1048, 4 do. hole elongated, obscurely trilobed.—1049, 5 do. hole sub-linear, lobed in the middle.

Tablet 1050 contains 5 sp. ribs varying from fine and equal to very coarse and unequal.—1051, 3 sp. red colour developed outside.—1052, 7 sp. with more or less of red stains within.—1053, 2 sp. dark line round callus well developed.—1054, 2 sp. elevated growth.—1055, 1 sp. with two large perforations (made by ?Lithophagi.)

274. FISSURELLA NIGROCINCTA, *n. s.*

"*F. t. ovali, latâ, conicâ; albâ, lineis nigris radiantibus eleganter pictâ; striis radiantibus tenue cælatâ; aperturâ subcentrali, obscure trilobatâ; intus albâ, margine tenue crenulato, denticulis nigris; callositate albâ, lineâ nigrâ cinctâ.*"

"Differs from the young of F. alba in its greater breadth, less compressed growth, finer striæ and crenulations; from F. nigropunctata, in the black line round the callosity; and from both in the form of the hole, which is trilobed, not contracted in the middle. *Long.* ·75, *lat.* ·52, *alt.* ·3."

Proc. Zool. Soc. Dec. 1855.

Hab.—Mazatlan, Mus. Cuming.—?Do.; extremely rare, on Spondylus calcifer; *L'pool Col.*

Tablet 1056 contains one of two very young specimens ·07 in length, which may belong to the above species, described from specimens in the Cumingian Collection. Although so small, it displays no trace of spiral vertex. Shell white, with black stripes. Hole suboval: this may be a character of youth.

275. FISSURELLA ————, *sp. ind.*

Shell elongated, conic, much compressed; ribbed as in F. virescens, &c.; anterior side shortened; hole long, narrow, trilobed; colour green within, nigropunctate at the margin;

callus white, corrugated, not bordered. Differs from F. nigropunctata in the shape of the hole; from F. virescens in this and in the nigropunctation; from F. alba in both characters, in the green colour, and in the still more compressed growth as compared with that species; from F. nigrocincta, in the green colour and absence of black ring; from the conical variety of F. rugosa in the regular growth, and nigropunctation, which is never seen in that variable species. The outside not being in good condition, and the young of some of the above species not having been observed, it is not thought prudent to name it. *Long.* ·55, *lat.* ·36, *alt.* ·2. *div.* 90° by 85°.

Hab.—Mazatlan; 1 sp. only; *L'pool Col.*

Tablet 1057 contains the specimen.

276. FISSURELLA ALBA, *n. s.*

F. t. oblongâ, compressâ, conicâ, regulari, antice curtiori; albâ, rarius nigro radiatâ; liris radiantibus, subæqualibus, interdum lævioribus, interdum validis, valde nodulosis; aperturâ majore, oblongâ, in medio constrictâ, parietibus solidis, sæpius in medio elevatis; intus albâ, seu pallidissime carneâ, rarissime vix viridi tinctâ, nitente, sæpius annulo nigro callositatem oblongam circumeunte, margine secundum liras crenulato, in testâ juniore sæpe nigropunctatâ.

Jun. ? = F. gemmata, *Mke. Zeit. f. Mal.* 1837, p. 186, no. 42.

This well marked species is easily recognized by its elongated, compressed, conical and regular growth. The young shell is often rayed outside, and dotted in the inner margin with black: else it is of a French white, or very pale flesh colour, glossy inside: rarely with a slight greenish tinge near the callus. The ribs are generally rather fine and irregularly tuberculous; sometimes strong and nodulous; very rarely slender and almost smooth. The black band round the callus is usual, but not constant. The F. gemmata of *Mke.*, described from a single small shell, is probably a rubbed young specimen of this species; but the diagnosis does not accord with sufficient accuracy to adopt his name. The shells are generally more or less incrusted with coralline, which often grows in irregular longitudinal rays, occasionally meeting over the centre of the hole, which they thus render bipartite. The aperture is large and long; its walls constricted in the middle and at the same place elevated on each side. The smallest shell found, in

which the hole preserves the normal characters, measures

	long. ·48,	*lat.* ·3,	*alt.* ·15.
The largest sp. (elongated)	„ 1·67,	„ 1·06,	„ ·6.
A normal sp.	„ 1·56,	„ 1·08,	„ ·62.
A conical sp.	„ 1·34,	„ ·96,	„ ·62.

Hole of largest sp. ·3 by ·12. *Div.* 95° by 105°.

Hab.—Mazatlan; common; *L'pool Col.*

Tablet 1058 contains 8 sp. different ages, normal state.—1059, 3 sp. elongated.—1060, 3 do. smooth.—1061, 3 do. elevated, nodulous.—1062, 4 sp. shewing interior.—1063, 3 sp. with singular growth of coralline.—1064, 1 do. smooth, with Acmæa mitella in situ.—1065, 1 do. nodulous, with dried animal of adherent limpet.—2066, 2 sp. hole abnormally produced, (div. 85°.)—1067, 3 sp. with Balani, and attachments of limpets. In one (empty), a young Isognomon has taken up its abode. Another (spinous) has inserted a fang through the hole of the shell.—1068, 3 sp. distorted growth.

SECTION B. *Margin smooth.*

277. FISSURELLA PERUVIANA, *Lam.*

Lam. An. s. Vert. vol. vii. p. 599, no. 17.—*B. M. Cat. D'Orb. Moll.* p. 51, no. 432.

+Fissurella subrotundata, *Desh. Enc. Méth.* Vers, vol. ii. p. 135, no. 11:—*Lam. An. s. Vert.* vol vii. p. 602, no. 26.

Var. = Fissurella affinis, *Gray, Proc. Zool. Soc.* 1834, p. 125.—*Sow. Conch. Ill.* p. 4, no. 35, f. 44.

Cremides Peruviana, *H. & A. Ad. Gen.* i. 446.

Only one specimen, and that somewhat worm-eaten, was found of this characteristic S. American shell. Shell very conic, slightly ribbed, hole nearly round, anterior side pointed, inside white, with a sharp, non-crenated, narrow margin, shaded with purplish brown. *Long.* 1·35, *lat.* 1·12, *alt.* ·68.

Hab.—Peru, *Humboldt & Bonpland.*—Is. Mexillones, Lobos; Iquiqui and Valparaiso; *Cuming.*—Mazatlan; 1 specimen; *L'pool Col.*

Tablet 1069 contains the specimen.

278. FISSURELLA SPONGIOSA, *n. s.*

F. t. elongatâ, compressâ, conicâ, antice angustiore, postice dilatatâ; superficie externâ quasi spongiosâ, nec liratâ nec striatâ; viridi, juniore lineis, adultâ maculis castaneis radi-

antibus pictâ; aperturâ elongatâ, obscure trilobatâ; paginâ internâ nitente, cinereo-albidâ, maculis externis plus minusve monstrantibus, callositate marginem versus rubro-purpureo: cicatrice musculari irregulari, intus callosâ, antice punctulatâ; margine acuto, haud crenulato, testâ juniore castaneo punctato.

Only two specimens were found of this singular little shell; the younger one of which, though the most highly coloured, is diseased within, and displays neither the lurid colour of the fæcal callus, nor the punctures on the anterior part of the general callosity which fills up the space between the irregularly jagged muscular scar and the region of the hole. It most resembles F. catillus, *Rve.* The external surface is loose and rough. *Long.* ·7, *lat.* antice ·3, postice ·43, *alt.* ·24, *div.* 105° by 80°. Hole ·14 by ·04.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1070 contains the larger specimen.

Subgenus GLYPHIS.

Animal margine pallii fimbriatâ, marginem testæ superante. Testa superficie cancellatâ, margine crenulato, callositate sæpe truncatâ, interdum laminatâ; testâ juniore Rimulæformi, spirâ in aperturâ crescente absorptâ.

Lucapina, *H. & A. Ad. Gen.* i. 447, (maxima pars): non *Gray.*

279. Glyphis inæqualis, *Sow.*

Fissurella inæqualis, *Sow. Proc. Zool. Soc.* 1834, p. 126:—*Conch. Ill.* no. 36, f. 45.—*Rve. Conch. Ic.* pl. 7, sp. 50.

Lucapina inæqualis, *H. & A. Ad. Gen.* i. 447.

+ Fissurella pica, *Sow. Proc. Zool. Soc.* loc. cit:—*Conch. Ill.* no. 37, f. 32, et var. f. 33.—*Rve. Conch. Ic.* pl. 7, sp. 49.—*Mke. Zeit. f. Mal.* 1847, p. 186, no. 39.

Lucapina pica, *H. & A. Ad. Gen.* i. 448.

The extreme forms of this species are very dissimilar; the one being very inæquilateral, with a long narrow trilobed slit, and sharply truncated bicuspid callus within: the other subæquilateral with a nearly circular hole, and the callus not truncated. The specimens with an oval hole are F. pica, *Sow.* and the subæquilateral form is figured in the *Conch. Ill.* as F. pica, var. Between the extremes, there is every gradation,

so that no point can be fixed on where one begins and the other ends. The present series is carefully selected from several hundred specimens, with a view to shew the gradations and extremes of variation. The external surface is more or less strongly cancellated, and the margin similarly denticulated. Very rarely it approaches the form of G. alta. A young specimen ·085 in length, displays a flattened spiral vertex as in Rimula, with the hole adjacent, well-formed and encroaching on the vertex, without channel; outside suboval, very slightly constricted; inside with the callus not truncate. The largest specimen measures *long.* 1·, *lat.* ·56, *alt.* ·26.
A broad sp. ; „ ·53, „ ·34, „ ·15.
A conical sp. „ ·58, „ ·4, „ ·23.
An inæquilateral sp. measures *long. ant.* ·24, *long. post.* ·54.
A subæquilateral sp. „ „ ·23, „ ·29.
Div. 100°—135°.

Hab.—Guacomayo & Gallapagos Is.: under stones on the shore; *Cuming.*—(F. pica) St. Elena and Gallapagos Is.; on dead shells 6—8 fm.; *Cuming.*—Var. Monte Christi, *Cuming.*—Mazatlan; not common; *L'pool Col.*

Tablet 1071 contains the very young sp.—1072, 4 sp. normal shape, different ages.—1073, 5 sp. shewing changes of colour within.—1074, 7 sp. shewing change in form from G. inæqualis to G. pica.—1075, 4 sp. shewing change in form of internal callus.—1076, 2 sp. strongly cancellated.—1077, 3 sp. shewing changes from depressed to conical.

280. GLYPHIS ALTA, *C. B. Ad.*

Fissurella alta, *C. B. Ad. Pan. Shells*, pp. 236, 320, no. 355.
Lucapina alta, *H. & A. Ad. Gen.* i. 447.

This pretty little species is known by its very conical, narrowed shape, and strong cancellating ribs. The smallest specimen ·04 in length, displays a well curved Rimuloid apex, and a round central hole, without channel; another smaller hole in the spire may be accidental, or it may display the relationship of the family to Haliotidæ. Another specimen, though only ·1 in length, has lost all trace of spire, but presents the characteristic suboval, slightly bilobed hole of the species. The shell is produced and thick at the vertex: interior callosity truncate and slightly indented anteriorly. *Long.* ·49, *lat.* ·32, *alt.* ·23.

Hab.—Panama, rare, *C. B. Adams.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1078 contains the two smallest specimens.—1079, the largest specimen.

Genus RIMULA, *Defr.*

Vide *A. Ad. Monogr. Rim.* in *Proc. Zool. Soc.* 1851, p. 226:—*H. & A. Ad. Gen.* vol. i. p. 451.—Non Rimula, *Lowe, Proc. Zool. Soc.* 1854, p. 181.

This beautiful genus is exactly intermediate between Fissurella and Emarginula; representing permanently the young state of Fissurella, and, apparently, in its own young state resembling Emarginula. Like other Oolitic forms, it has hitherto been found recent only in the Eastern Seas.

281. Rimula Mazatlanica, *n. s.*

R. t. parvâ, oblongâ, compressâ, conicâ; albidâ, epidermide tenui albo-fuscâ indutâ; apice planatâ, angustâ; superficie tenue cancellatâ, cancellis quadratis; fissurâ subelongatâ, subquadratâ, intus subovali, callosâ, extus interdum vix lobatâ, ex quadrante dimidium versus totæ ab apice ad marginem longitudinis continuâ; foramine lineis incrementi decussato apicem versus currente; margine tenue crenulato.

This shell would have been taken for the young of Glyphis inæqualis, which in general appearance it greatly resembles; but that fortunately the young of both that species and G. alta were found, differing in the following particulars. In the Glyphides, the hole is close to the apex, comparatively large and solid, and so arranged that as the hole increases, the apex is eaten away. In the Rimulæ (of which 12 specimens were found of different ages) the slit occupies a portion extending from one-fourth to one-half of the entire length from apex to margin; and though the largest shell is much larger than the Glyphis, the apex still continues in the same relative position, and there is a channel running up to the vertical portion, shewing the lines of previous slits as in Pleurotomaria. The lines of growth on the young shell seem to shew that at one time it took the form of Emarginula, afterwards enclosing its slit. In this respect it is the reverse of Scissurella, which (as appears from specimens found in the Teneriffe dredgings) when young is like Rimula or Trochotoma, when adult like

Emarginula. The plan of cancellation and the form of the slit differ somewhat in the specimens, but probably not specifically. The smallest shell, though scarcely ·04 in length, displays a channel ·01 long, as in the adult. The largest measures *long.* ·125, *lat.* ·07, *alt.* ·035.

Hab.—Mazatlan; on Spondylus calcifer, extremely rare; *L'pool Col.*

Tablet 1080 contains 3 sp. of different ages.

Family HALIOTIDÆ.

Nihil.

Family TROCHIDÆ.

Genus CALLOPOMA, *Gray.*

Fig. Moll. An. p. 87, no. 5:—*Phil. Handb. Conch.* p. 206:—*H. & A. Ad. Gen.* i. 395.

Turbo, sp., *auct.*—Distinguished by the extreme complexity of the operculum: *v.* infra.

282. Callopoma (Turbo) fluctuosum, *Mawe.*

Turbo fluctuosus, *Gray* in *Wood Suppl.* p. 20, pl. 6, no. 44.—*Mke. Zeit. f. Mal.* 1847, p. 179, no. 8:—do. 1850, p. 170, no. 25.—*Kust. Chemn.* p. 60, no. 55, pl. 14, f. 3, 4 c.

Turbo fluctuatus, *Rve. Proc. Zool. Soc.* 1843, p. 52:—*Conch. Ic.* sp. 34, pl. 8, no. 34.

Trochus (Turbo) Fokkesii, *Jonas*, in *Phil. Abbild.* no. 1, pl. 2, f. 1, 10.—*Midden. Mal. Ross.* pt. ii. p. 86, no. 13.

Callopoma fluctuatum, *H. & A. Ad. Gen.* i. 395, pl. 43, f. 7, 7*a*, 7*b*.

Comp. Callopoma ?fluctuatum, *var.* depressum, *Proc. Zool. Soc.* 1855. (=Turbo f. *var. Rve. Conch. Ic.* pl. 9, f. 3 *c.*)=Turbo funiculosus, *Kien. Icon. Conch.* pl. 30, f. 1.

Almost all the numerous specimens of this beautiful shell fell victims, after I had first examined them, to the grindstone and acid. The exquisitely beautiful opercula were however thrown to one side as useless, and so preserved. These are flat and covered with a dark horny layer inside, displaying about 6 whirls. Outside with a broad central spiral callus, white and granular, concealing the umbilicus, with extremely minute pustules over the surface, sometimes with a few sharp prickles. A deeply cut groove surrounds the callus, followed by a green

plaited spiral frill, prickly inside. Between this and the outer margin are 4—6 (generally 5) fine emerald necklaces, supported on slender spiral ribs, with deeply channeled interspaces. The margin and the body of the operculum are white. The operculum of its neighbour, C. saxosum (Panama, *C. B. Adams*, S. W. Mexico, *P. P. C.*) is formed on a much coarser plan, with the central callus not covering the umbilicus, the frill rather granular than plaited, the three rows of necklaces close together, without deep channels, and with large granules on the margin. All the Mazatlan shells were of the typical form, with the spire elevated, whirls well rounded, with distant rows of nodules. Whether the C. f. depressum is a variety of this form, (as I described it in the P. Z. S., copying Reeve's error in the name, and not aware that Kiener had figured it,*) or another species, cannot be decided without a knowledge of the operculum. The shell is distinguished from all varieties of C. saxosum, by the non-corrugation of its surface. *Long.* 2·56, *lat.* 2·5, *div.* 90°.

Hab.—Punta St. Elena, *Cuming.*—Mazatlan; abundant; *L'pool Col.*—San Diego, *Lieut. Green.*—Sitka, *Wosnessenski*, Middendorff.

Tablet 1081 contains the largest specimen, in its natural rough state.—1082, the sp. which suffered least from hot acid.—1083, 6 opercula of different ages, and of exquisite beauty.

Genus PHASIANELLA, *Lam.*

Lam. Phil. Zool. 1809.—*Phil. Handb. Conch.* p. 205.
Eutropia, *(Humph.) Gray*, 1847.—*H. & A. Ad. Gen.* vol. i. p. 389.
Phasianus, *Montf.* 1810.—Tricolia, *Risso*, 1826.

283. Phasianella perforata, *Phil.*

Zeit. f. Mal. 1848, p. 164, no. 34.—*Kust. Mart.* p. 20, sp. 24, pl. 4, f. 14.
Comp. Phasianella tessellata, *Beck*, 1838, *Pot. et. Mich. Gall.* vol. i, p. 312, pl. 29, f. 7, 8.—*C. B. Ad. Contr. Conch.* 1850, p. 67.—*Phil.* in *Kust. Mart.* p. 18, sp. 22, pl. 4, f. 12.—=Ph. minuta, *Anton*, 1839, *Verz.* p. 60, no. 2129, (non *Sow.*)—=Ph.

* I have seen no letter-press in explanation of the figure, nor are any dates given in Kiener's monographs, by which questions of priority can be determined.

zebrina, *D'Orb.* 1842, *B. M. Cat. Cuba. Moll.* p. 23, no. 256. (Jamaica, *C. B. Adams;* Guadaloupe, *D'Orbigny;* Cuba, *Sagra.)*

This beautiful shell closely resembles the W. Indian species. Like many of its congeners, it has parallel diagonal lines of colour; and is also variously and most beautifully stained with red and brown. The first whirl of the five is discoidal. It is characterized by extremely minute wrinkling over the whole surface, only discernible under the microscope, when quite fresh. The umbilicus is very large when young, and sharply keeled: when adult, it is often nearly filled up by the callous labium. Operculum radiately wrinkled over a large part of the outer surface; within, spire produced, sharply keeled. The largest specimen measures *long.* ·13, *lat.* ·12, *div.* 70°.

The smallest sp. „ „ ·032, „ ·037, „ 90°.

Hab.—Payta, Panama, *E. B. Philippi.*—Mazatlan; 12 sp. among algæ, on Uvanilla olivacea, &c.; *L'pool Col.*

Tablet 1084 contains 5 specimens shewing the principal varieties of colour, red, ashy and mottled, the largest of which has its operculum in situ; also 2 separate opercula.

283 *b.* PHASIANELLA ? PERFORATA, *var.* STRIULATA.

P. t. "*P. perforatæ*" *simili, sed lineis coloris carente; rufo punctatâ et varie maculatâ; striis spiralibus intus umbilicum et in basim, nonnunquam supra spiram.*

Only two dead shells having been found agreeing in the above characters, their specific value cannot be tested. One of the specimens is very slender, the other of the ordinary form. There is no trace of the minutely wrinkled surface. *Long.* ·09, *lat.* ·07, *div.* 50°.

Hab.—Mazatlan; 2 sp. in shell washings; *L'pool Col.*

Tablet 1085 contains the slender specimen.

284. PHASIANELLA COMPTA, *Gould, ms.*

"*Ph. t. parvâ, solidâ, ovato-conicâ, imperforatâ, politâ, cinerascente, lineis minutis olivaceis, oblique volventibus, ornatâ; anfractibus* iv. [v.] *rotundatis, ultimo ad peripheriam subangulato, et interdum tessellatim fasciato; aperturâ circulari; labro tenui, albo; columellâ planulatâ, albâ; faucibus callo incrassatis.*"

"Would accord pretty well with Ph. perforata, but is not perforate," at any rate in the adult state. Only one very dead shell and some fragments were found of this species, which appears to be sufficiently common on the Californian coast, where it represents the Ph. perforata of the tropical fauna. In the Sta. Barbara specimens, the colour and general appearance resemble the small variety of Ph. pullus. The operculum only differs from that of Ph. perforata in having the wrinkles rather coarser, and not covering quite so large a surface: this however may be only the effect of age. One of Dr. Gould's specimens from San Diego measures *long.* ·22, *lat.* ·13, *div.* 60°. The Mazatlan shell is much smaller.

Hab.—San Diego, *Mr. Bldke & Dr. Webb.*—Sta Barbara, off zoophytes, *Col. Jewett.*—Mazatlan; 1 dead sp. in shell washings; *L'pool Col.*

Tablet 1086 contains the specimen.

Genus BANKIVIA, *Beck.*

Beck, in *Krauss, Sudafr. Moll.* 1848.—*H. & A. Ad. Gen.* i. 425.—*Phil. Handb. Conch.* p. 212.

285. Bankivia varians, *jun, Beck.*

Phil. in *Kust. Mart.* p. 33, pl. 5, f. 1—5.—*Krauss, Sudafr. Moll.* p. 105, pl. 6, f. 7.
= Phasianella fasciata, *Mke. Syn. Moll. Nov. Holl.* ed. 2, p. 141.
+ P. undatella, *Mke.* loc. cit.
+ P. fulminata, *Mke.* loc. cit.—*Anton Verz.* p. 61, no. 2137.

One very young fresh specimen of this well marked shell was found on the back of a Chama. It exactly resembles young shells from Australia. How it had found its way from its native haunts, it is impossible to say. It is of the uniform red variety, with a dark sutural line. There are 4 turns of the spire, with a very flattened apex. *Long.* ·06, *lat.* ·05; divergence of last whirl 40°; the next would probably be much less. Anton's name has precedence over that adopted by Krauss, teste *Gray.*

Hab.—Australia, *Menke.*—South Africa, *Krauss.*—Mazatlan; 1 very young sp. off Chama; *L'pool Col.*

Tablet 1087, contains the specimen.

Genus UVANILLA, *Gray.*

Fig. Moll. An. p. 87, no. 8:—*H. & A. Ad. Gen.* i. 400.

Imperator, sp *Montf. auct.* = Calcar, sp. *Phil. Handb. Conch.* p. 107.—Distinguished by the want of umbilicus, and the bi-ridged operculum.

286. Uvanilla (Imperator) olivacea, *Mawe.*

Trochus olivaceus, *Gray* in *Wood Suppl.* p. 16, no. 3, pl. 5.—*Kien. Ic.* pl. 13, f. 2, *(parva.)*—*Rve. Conch. Syst.* pl. 217, f. 7.—T. (Calcar) ol. *Mke. Zeit. f. Mal.* 1850, p. 171, no. 28.—*Kust. Mart.* no. 226, p. 214, lf. 103, pl. 32, f. 3, lf. 84 (quasi *Wood*):—do. *loc. cit.* f. 2, (quasi *Rve.*)

Imperator olivaceus, *P. P. C. Cat. Prov.* et hic antea.

Uvanilla olivacea, *H. & A. Ad. Gen.* i. 400, pl. 6 *a*, 6 *b*, 6 *c*.

= Trochus brevispinosus, *Val. Voy. Ven.* (non *Lam.*)—*Chenu, Conch. Ill.*

= Trochus (Calcar) erythrophthalmus, *Phil.* in *Zeit. f. Mal.* 1848, p. 188.—*Kust. Conch. Cab.* p. 93, pl. 45, f. 3.

Jun. ? = Trochus (Calcar) Melchersi, *Mke.* in *Zeit. f. Mal.* 1850, p. 171, no. 29.

Comp. Trochus Buschii, *Phil.*: v. *Zeit. f. Mal.* 1848, p. 189, no. 67.—*Kust. Mart.* no. 265, lief. 103, p. 213, pl. 32, f. 1, lief. 84 (Panama.)—*Kien.* loc. cit. pl. 31, f. 1, 1 *a*.

Philippi, having regarded the T. olivaceus of *Wood* to be distinct from that of *Reeve*, re-named the latter, which has a red pillar, T. erythrophthalmus. According however to the type in the collection of Dr. Gray, the red-tinted shell, figured as such by *Reeve*, is the true T. olivaceus of *Wood*, which name is therefore retained.—The T. Buschii, as figured by Kiener, almost exactly accords with U. olivacea; but the outside is covered rather with corrugations than with slanting ribs: umbilicus faint red: base covered with obsolete rounded spiral costæ.

Shell large, rather thin. Whirls rather swollen in the body, crossed by very numerous, slanting rugæ, perpendicular to the labral margin, and generally continued to the periphery. This is expanded, winged, and armed with a very variable number (20 or upwards) of vaulted tubercles. Base concave within the

wing, so that the expansion of each penultimate whirl lies closely over the next. A depressed portion, bounded by two spiral lines, appears between the body and the wing, forming a false suture on the spire. Base with very fine striæ of growth; with a nodulous spiral raised keel about the middle, and a nodulous line within, bounding the umbilical region. This is of a lustrous orange red, shading into black over a dull, sometimes slightly bifid spiral subcentral keel. The umbilical mark is but moderately excavated, with a slight central callosity. Labrum extending one-fourth of a whirl. Parietal labium covering the inter-carinal region for another fourth. The rest of the shell (base and spire) is covered with an oblivaceous epidermis, lying in strongly striated lines of growth. Colour beneath the epidermis dark green, more or less tinged with red, especially in the young shell. The medial portion, wing and tubercles, are often very slightly shewn in the adult. The shell when in good condition is extremely beautiful; but it is almost always covered with animal and vegetable incrustations. It is subject also to the attacks of Lithophagi and Gastrochænæ, which generally have the instinct to burrow along the thick winged portion, or down the axis; but often venture to invade the liver-chamber in the upper whirls, when the Trochid withdraws itself, forming partitions as in Turritella, &c. Operculum smooth, outside with two strong ridges, beginning from nearly the same point, and meeting at the other end; of which the outer is far larger; with a deeply-scooped hollow within; and a faint ridge at the outer margin. Inside obtusely raised at the back of the large ridge; with blackish brown horny covering. The largest sp. measures *long.* (from apex to wing at base) 2·9, *lat.* ·26, *div.* 65°. A spreading sp. *long.* 1·9, *lat.* 2·15, *div.* 80°.

Hab.—Mazatlan; extremely abundant; *L'pool Col.*—S. W. Mexico, *P. P. C.*

Tablet 1088 contains 5 sp. different ages, spreading var.—1089, 5 do. usual form.—1090, 3 do. very conical.—1091, 4 sp. after going through the acid process, with the beautiful basal epidermis removed, but displaying the exterior markings.—1092, 4 sp. with base beautifully preserved.—1093, 2 sp. mended after fracture.—1094, 1 sp. with the mouth curiously distorted by an Ostrea conchaphila. Each party has raised its lip to escape the other.—1095, 1 sp. with Lithophagus aristatus in situ. Having bored through an empty barnacle as far as the interior, it has increased outwards, making an external tube.

287. UVANILLA INERMIS, *Gmel.*

U. t. "*U. olivaceæ*" *simillimâ; sed sculpturâ fortiore, rugis in spirâ distantioribus; lineâ granularum internâ in basi vix monstrante; regione umbilicali albâ, cavitate profundâ, carinâ spirali acutâ circumeunte, extus vix excavatâ; callositate tenui diffusâ.*

Trochus inermis, *Gmel.* p. 3576, no. 62.—*Schroet. Einl.* vol. i. p. 719, no. 100.—*Dillw. Descr. Cat.* vol. ii. p. 787, no. 67.—*Lam. An. s. Vert.* vol. iv. p. 127, no. 17.—*Kien. Icon. Conch.* pl. 14, f. 2, 2 *a*.

= Trochus olivaceus, *Phil.* in *Zeit. f. Mal.* 1848, p. 188: non *Gray* in *Wood.*

This shell, which was brought in some abundance by Capt. Kellett, is not the T. olivaceus, *Wood*, as *Phil.* seems to have supposed. There can hardly be a doubt that it is the species figured by *Kien.* and therefore, it is presumed, of *Lam.* Whether it be that of the Linnæan writers. can scarcely be determined, when the differences are so slight.

It exactly remembles U. olivacea in almost all respects: but has coarser, more distant rugæ on the body of the whirls; and in the umbilical region is white, more resembling U. unguis. Base with the inner row of granules scarcely developed: umbilicus deeply scooped, covered with a thin diffused callus, bounded by a sharp spiral ridge, scarcely scooped outside. The young shell has a fine keel in the place of the inner row of nodules, marked off by two faint spiral grooves, on the medial portion. Whether it be really distinct from U. olivacea must await a knowledge of the operculum, and a comparison of additional specimens. The smallest sp., of 6 whirls, measures *long.* (apex to basal wing) ·86, *lat.* ·98, *div.* 80°.

Hab.—Mazatlan; 2 young sp. only; *L'pool Col.*

Tablet 1096 contains the youngest (most characteristic) sp.

288. UVANILLA UNGUIS, *Mawe.*

Trochus unguis, *Mawe*, in *Wood Ind. Test. Suppl.* p. 16, no. 2, pl. 5.—*Rve. Conch. Syst.* vol. ii. p. 165, pl. 217, f. 6.—*Kien. Icon. Conch.* pl. 13, f. 1 (max.)

Turbo unguis, *Desh.* in *Lam. An. s.* Vert. vol ix. p. 224, no. 42.

= Turbo digitatus, *Desh. Mag. de Guér.* 1841, pl. 36.

= Trochus amictus, *Val. Voy. Venus.*

p = Trochus (Calcar) stellaris, *Mke.* (non *Lam.*) in *Zeit. f. Mal.* 1850, p. 172, no. 30.

This most abundant Mazatlan shell not being quoted by Menke in his catalogue, while the true T. stellaris (Stella st. *Gray*) is a well known E. Indian shell, it is natural to suppose that his T. stellaris (which is published without a word of description) either belongs to this species, or has been imported. — The Cumingian specimens had (by an oversight) been marked T. undosus. The true T. undosus, *Mawe, (Wood Ind. Test. Suppl.* p. 16, no. 1, pl. 5. = Pomaulax u. *Gray*)* is a very large Californian species, the singular triradiate operculum of which was found fresh in the S. W. Mexican collection. Shell yellowish white, somewhat silvery at the mouth; more or less conical, with irregular, radiating, somewhat diagonal rounded plications, and often finely tubercular rugulæ between; slightly swollen next to the suture, and slightly concave above the periphery, but flattened in its general aspect. Base with rounded close spiral ridges (6—8 appearing) crossed by very close sharply-raised lines of growth, and faintly denticulating the base of the labrum. Periphery with a variable number (14—18, generally 16) of rounded palmæ, more or less projecting, more or less broad, concentrically furrowed by the basal ridges of growth, and not necessarily connected with the external plications. Aperture with the labrum developed along half a whirl, uniting with the parietal labium which covers half the base, expanding over the umbilical region and ending in a raised portion below the axis. Columella with two spiral umbilical grooves, of waxen aspect, separated by a white rounded ridge ending in a tubercle just outside the mouth. The labrum is indented by the exterior plications which are at right angles to its margin. The shell is rarely seen in perfection, being almost always covered, even when young, with a variety of Algæ, Corallines, Annelids, Bryozoa, Vermetidæ, &c.; and also, not unfrequently, attacked by Gastrochæna truncata and Lithophagus aristatus. Even the base, to the very edge of the labium, is frequently covered. The operculum differs from

* "T. undosus, *Wood*, is a very much smaller shell than T. balænarum, *Val. Voy. Ven.* and differs in the style and number of nodosities in the whirls. In T. balænarum these amount in the last whirl to five rows, all much of the same size and round form. In T. undosus there are only two rows, and the upper of these are long, not round, and much larger than in T. balænarum." *Baird.*—T. balænarum is generally regarded as a variety of T. undosus, in which the upper long row of tubercles is broken up into smaller rounded ones. If the two forms are however constant in their respective provinces, they may be representative species.

that of U. olivacea in being sharper at the outer edge, more or less granular on the ridges (in the young shell over the whole surface), and with the small interior rib beginning within the other. Its apex fits against the periphery of the shell. A very finely grown spreading specimen measures *long.* 1·2, *lat.* 1·7, (without the palmæ 1·36,) *div.* 80°. The largest, conical sp. measures *long.* 1·73, *lat.* 1·8, (without the palmæ 1·56,) *div.* 60°.

Hab.—Mazatlan; extremely abundant; *L'pool Col.*—S. W. Mexico, very fine, *P. P. C.*

Tablet 1097 contains 5 sp. different ages, spreading variety.—1098, 6 sp. do. ordinary form.—1099, 3 do. conical.—1100, 3 do. sculpture clear.—1101, 1 do. curiously mended after fracture.—1102, 1 do. upper part eaten away, leaving the liver chamber with the whirls disunited, like Vermetus.—1103, 1 do. curiously crowned with Coralline.—1104, 1 do. covered with Algæ.—1105, 2 do. bored by young Lithophagi.—1106, 1 do. with large Annelid, of which an operculum is added from a full grown sp. on Spondylus, distinguished by the two large and two small branching stag's-horn processes.

Specimens shewing base. Tablet 1107 contains 3 sp., palmæ broad, expanded.—1108, 1 do. more distant.—1109, 1 do. very narrow.—1110, 2 do. palmæ numerous.—1111, 3 do. irregularly developed.—1112, 1 do. with labium narrowed by Sabellariæ, which, along with Bryozoa contending with Vermetidæ for superiority, have covered the base.—1113, 1 do. with base curiously rounded.—1114, 1 do. mouth blistered.—1115, 1 do. with attachment of Calyptræid outside the basal edge of the mouth.

Tablet 1116 contains 2 sp. with the opercula in situ, one young, the other adult.—1117, 6 opercula.

Genus TROCHUS, *Linn.*

Trochus, *Linn., auct.*; pars:—*Phil. Hand. Conch.* p. 210. The ancient name is retained for these, the ordinary forms of the original genus.

Ziziphinus, *Leach*:—*H. & A. Ad. Gen.* vol. i. p. 421:—*Mon.* in *Proc. Zool. Soc.* 1851, p. 163.

289. Trochus versicolor, *Mke.*

Zeit. f. Mal. 1850, p. 172, no. 32.

? = Ziziphinus Californicus, *A. Ad. Proc. Zool. Soc.* 1851, p. 168, no. 52.

Comp. Trochus eximius, *Rve. Proc. Zool. Soc.* 1842, p. 185. (Payana, sandy mud, 10 fm. Mus. Cuming.)

This beautiful species is characterized in sculpture by a more or less sharp angular keel, at about 3-5ths of the breadth of the penultimate whirl, the whole surface being covered with very fine subgranular spiral striæ; basal periphery at a rounded angle; base with about 9 distant, nearly smooth and scarcely raised striæ. Colouring variegated with ashy and light orange brown, very rarely wholly of a rufous tinge, stained about the granules and on the basal lines with lustrous purplish red, also with rich orange. The first whirl is depressed, smooth, rounded; gradually passing into very coarse decussation, leaving deep pits between; these pass into three strongly nodulous ribs, the lower gradually changing into a keel, small ones developing between the others, and both nodules and ribs gradually subsiding into the typical state. The young shell is of a uniform orange brown or reddish tinge. Whirls 10. Very few specimens possessed the operculum, which is extremely thin, of many whirls (16 in a shell of 9 whirls,) with very delicate radiating striæ, somewhat curved, and most developed near the margin of each whirl. *Long.* 1", *lat.* '92, *div.* 65°.

Hab.—Mazatlan; common; *L'pool & Havre Coll.*

Tablet 1118 contains 4 sp. various ages.—1119, 2 sp. extreme forms, div. 60°-80°.—1120, 5 sp. shewing base and variations of sculpture.—1121, 2 sp. with hermit crabs.—1122, 1 sp. with operculum.

Specimens shewing colour.—1123, 4 sp. dark, variegation in large pattern.—1124, 3 do. with narrow streaks of light.—1125, 3 do. nearly uniform, dark.—1126, 3 do. light and dark equal.—1127, 3 do. light predominating.—1128, 3 do. nearly uniform, light.

290. TROCHUS MAC-ANDREÆ, *n. s.*

T. t. subelevatâ, conicâ, anfractibus convexiusculis, suturâ distinctâ; rubrâ, maculis pallidioribus: liris spiralibus nodosis cinctâ, in anfr. penult. vi. *quarum inferiores duæ paullum majores sunt; interstitiis impressis, lirulis interdum intercalantibus; tuberculis confertis, rotundatis, extantibus; peripheriâ vix angulatâ; basi lirulis vix granulosis, circiter* xi. *ornatâ, interstitiis latis; columellâ haud insculptâ, parum contortâ, regione umbilicali impressâ.*

VAR. *t. rufo-fuscâ, undatim pallidiore; basi rubro.*

Comp. Trochus minutus, *Mke.* in *Zeit. f. Mal.* 1850, p. 172, no. 31: non *Chemn.* in *Kust.* pl. 13, f. 16 (non 15.)

Characteristic names being for the most part preoccupied in this extensive family, I have felt at liberty to call this beautiful little species after a gentleman to whose personal researches we owe so much of our knowledge of the Mollusc-fauna of the Atlantic, and to whose kindness in the loan of valuable books and specimens I am under great obligations in the preparation of the present work.

Shell somewhat resembling a variety of Trochus Antonii, *Koch*, in *Phil. Abbild.* p. 2, pl. 1, f. 4: which however has a few granular rows much larger than the rest, which are extremely fine and far apart. The whole upper surface in T. Mac-Andreæ is covered with large tubercles. The base in T. Antonii is sculptured like the rest of the shell; and the columella has a smooth scooped-out surface, which is wanting in this species. The Mazatlan specimen, perhaps immature, has 7 whirls. *Long.* ·33, *lat.* ·34, *div.* 70°. The variety from Panama has 9 whirls, measuring ·55 by ·43, *div.* 60°.

Hab.—Mazatlan; 1 perfect sp. and fragments; *L'pool Col.*—Panama, 1 sp. *T. Bridges*, Mus. Cuming.

Tablet 1129 contains the specimen.

Genus OMPHALIUS, *Phil.*

Zeit. f. Mal. 1847, p. 21:—*Handb. Conch.* p. 210.
Omphalius + Chlorostoma, *H. & A. Ad. Gen.* i. 428, 429:—*Mon.* in *Proc. Zool. Soc.* 1851, p. 180.
Trochus, pars, *auct.* Shell with a spiral ridge surrounding the umbilicus, ending in one or more tubercles on the columella.

291. Omphalius ? rugosus, *var.* rufotinctus.

? Chlorostoma rugosum, *A. Ad.* in *Proc. Zool. Soc.* 1851, p. 182, no. 26.

O. ? rugosus, t. olivaceo-fuscâ, rufo seu rufo-purpureo plus minusve tinctâ; testâ juniore sulcis spiralibus subobsoletis, paucioribus, radiatim prope suturam haud impressam rugoso-plicatâ; labro ad marginem olivaceo, rarissime aurantio tincto; basi sulcis crebrioribus; testâ adultâ sæpissime detritâ.

The C. rugosum was described from an unknown locality. It appears in Mus. Cuming as from China, but without au-

thority. The differences in the Mazatlan shells appear too trifling to found specific distinction upon them. The characters of the shell can only be seen in the young state; in its ordinary form, it has the external aspect of the British Osilinus (Trochocochlea) lineatus; from which the umbilicated axis and nodulous columella at once distinguish it. *Long.* 1·17, *lat.* 1·08, *div.* 70°.

Hab. — China, Mus. Cuming. [?] — Mazatlan; very rare; *L'pool Col.*

Tablet 1130 contains the largest and smallest specimen.—1131, 1 sp. lip tinged with orange.

292. OMPHALIUS VIRIDULUS, *Gmel.*

Trochus viridulus, *Gmel.* p. 3574. — *Schreib. Conch.* vol. . p. 245.—*Dillw. Descr. Cat.* p. 777, no. 42.—*Wood Ind. Test.* no. 42, pl. 28, p. 136.

Omphalius viridulus, *H. & A. Ad. Gen.* i. 429.

Globulus ex viridi et rubro variegatus, *Chemn.* vol. v. p. 114, pl. 171, f. 1677:—(non Trochus variegatus, *Chemn.* p. 104, f. 1661-2:—*Dillw.* p. 774, no. 35: — =T. Capensis, *Gmel.* p. 3573: *Hab.* 'Cape of Good Hope.')

Phorcus variegatus, *A. Ad.* in *Proc. Zool. Soc.* 1851, p. 156.

=Trochus Brazilianus, *Mke.* teste *A. Ad. loc. cit.*

+Trochus Byronianus, *Wood Suppl.* p. 16, pl. 5, no. 17. (*Hab.* 'Sandwich Is.')

Var. =Trochus reticulatus, *Gould, ms. Cat.*

Comp. O. cruciatus, *Gmel.* (non *Linn.* teste *Phil.*, Brazils):— =O. Brazilianus, *Mke.* =O. Byronensis, teste Mus. Cum.

The single specimen which Mr. Cuming assigns to this very variable species, differs from all forms of O. ligulatus in the following particulars. Spiral liræ, both above and below, much fewer, with broad interspaces. Umbilicus somewhat corkscrew shaped, the parietal callosity being further off from the centre, while the spiral ridge is nearer to it. It appears also to want the seminodulous callous ridge at the base of the labrum. Colour dull red, slightly spotted with orange. *Long.* ·64, *lat.* ·76, *div.* 90°.

Hab.—Mazatlan, *Col. Jewett.*—Do.; 1 dead sp.; *L'pool Col.*—San Diego; very red variety; *Lieut. Webb.*

Tablet 1132 contains the specimen.

293. OMPHALIUS LIGULATUS, *Mke.*

Trochus ligulatus, *Zeit. f. Mal.* 1850, p. 173, no. 34.
? = Phorcus Californicus, *A. Ad.* in *Proc. Zool. Soc.* 1851, p. 157, no. 17 :—(Omphalius C.) *H. & A. Ad. Gen.* i. 429.
[Phorcus, *Risso*, teste *A. Ad.* = Omphalius, *Phil.*: teste *Phil.* = Trochus Magus &c. = Gibbula, *Leach*, *H. & A. Ad.*]
Comp. Phorcus liratus, *A. Ad. loc. cit.* no. 15 :—(Omphalius l.) *H. & A. Ad. Gen.* i. 429.

Shell about the shape and size of Phorcus (Gibbula) cinerarius, which takes its place in the Atlantic fauna, as P. umbilicaris does that of O. viridulus. Outside crowded with more or less fine, more or less subnodulose spiral ridges, of which one or more are occasionally more developed than the rest. Umbilicus more or less open to the top, where the thin nuclear part is generally punctured. Whirls 7, of which the first three are smooth and flattened. Mouth slanting: parietal callosity near the umbilicus, not projecting; columella between this and the spiral ridge deeply sinuated; spiral ridge ending in a broad diagonal callosity, close to which on the labium is a small tubercle, and at the base of the shell a large one. The area between these tubercles and the layer is rather deeply but shortly channeled. From the basal tubercle (in the adult shell) runs a callus round the inside of the base of the labrum which is sometimes subnodulous. Between this callus and the outer lip is a well marked channel. Shell outside covered with a rough brown epidermis, conspicuous between the ridges. The shell, even when young, is generally covered with Annelids, Bryozoa, &c. Colour beneath the epidermis brownish purple, or ashy brown, spotted in shades. Operculum outside deeply concave, *(div.* 150°,) of about 20 whirls, not thin, thickened at the margin, leaving a distinct suture, not striated; inside glossy, of an orange horn colour. A specimen of ordinary growth measures *long.* ·69, *lat.* ·77, *div.* 80°.
A flattened sp. „ ·47, „ ·93, „ 100°.
A conical sp. „ ·74, „ ·74, „ 70°.

Hab.—Mazatlan; common; *L'pool Col.*

Tablet 1133 contains 5 sp. whirls somewhat rounded, depressed.—1134, 4 do. somewhat depressed.—1135, 4 do. typical form.—1136, 5 do. conical.—1137, 5 sp. whirls flattened, depressed.—1138, 3 do. ordinary form.

Tablet 1139 contains 3 sp. ribs very fine.—1140, 3 do. nodulous.—1141, 2 do. curiously mended after fracture.—1142, 4 do.

with Bryozoa and Annelids attached.—1143, 1 sp. with attachment of Calyptræid.

Tablet 1144 contains 4 opercula.

294. OMPHALIUS GLOBULUS, *n. s.*

O. t. parvâ, globulosâ, compactâ, subconicâ; anfractibus v. *et dimidium, quorum* ii. *et dim. primi sublæves, alteri spiraliter tenue lirati; liris sublævibus, interstitiis latis; peripheriâ haud angulatâ; umbilico haud magno, spiraliter ascendente; callositate parietali haud conspicuâ, ab axi subdistante; regione umbilicali subconcavo, liris spiralibus fortioribus; columellâ tuberculo magno et callositate basali plus minusve distinctâ munitâ, prope eas profunde insculptâ; labro intus haud calloso; sub epidermide tenui, læviori, pallide purpureo-cinereâ, punctis et maculis purpureis pictâ.*

Comp. Trochus glomus, *Mke.* in *Zeit. f. Mal.* 1850, p. 173, no. 35: non *Phil.* in *Kust. Mart.* pl. 14, f. 15 (non 17;= Clanculus g. *H. & A. Ad. Gen.* i. 416,)

This shell is much more elevated and compact than the young of even the most conical variety of O. ligulatus; in sculpture and umbilicus more resembling O. viridulus. Its characteristic features however are the absence of the tubercle which in O. ligulatus always borders on the spiral columellar callosity, and the deep channeling of the adjacent area. The size of the umbilicus varies slightly. *Long.* ·3, *lat.* ·33, *div.* 80°.

Hab.—Mazatlan; 5 sp. only; *L'pool Col.*

Tablet 1145 contains the most characteristic specimen.

GENUS VITRINELLA, *C. B. Ad.*

Testa Margaritæ, Cyclostremati seu Adeorbi formâ simulans; minima, albida, subdiaphana, tenuis, plerumque subhyalina; superficie interdum lævi, plerumque sculpturâ varie ornatâ; anfractibus paucis, quorum plures sculpturæ desunt, normales i-ii., *rapide augentibus; umbilico maximo.*

Mon. Vitr. 1850:—*Pan. Shells*, p. 184: (pars.)—*Phil. Handb. Conch.* p. 207.—*H. & A. Ad. Gen.* vol. i. p. 434.—(Non *Gray, B. M. Cat. Pulm.* p. 65, 1855.)

This genus, constituted by Prof. Adams for 5 species from Jamaica, (of which one, V. megastoma, is an Ethalia,) and

enriched by 12 from Panama, (of which one, V. minuta, is a Teinostoma, as is also the ?Neritina pusilla from Jamaica of the same author,) consists of a group of exceedingly minute turbinate or discoidal shells, differing greatly in shape, but agreeing in colour and texture, which are white and subhyaline. They have but few, rapidly enlarging whirls: the aperture is generally much dilated and sinuated; the umbilicus is almost always large. They are either smooth and glossy; or variously ribbed, keeled or striated. In some respects they resemble Cyclostrema, in others Adeorbis. Indeed many of the species could not be separated generically from the forms figured by the author of the latter genus, *Searles Wood, Crag Moll.*, pl. 15, except by the texture. All the species examined agree in a remarkable disproportion between the nuclear and the adult parts of the shell. While the usual number of whirls is four and a half, three of these are occupied with the unformed shell, which is smooth in the sculptured species, and distinctly marked even in the glossy ones; while only one, or one and a half, (very rarely two,) suffice for the full grown portion. From this circumstance it might have been supposed that they are all young shells: but as they do not in the least resemble the young of any larger Mazatlan species, and as more than 150 individuals were found, all keeping to the same type, it is presumed that it indicates a peculiarity in the animal, which may serve to distinguish it from neighbouring genera. It is exceedingly to be regretted that Dr. Gray should have used the name over again last year for a genus of land shells.* Among the species described as Rotellæ by D'Orbigny and others (e. g. Globulus striatus, semi-striatus, pusillus, carinatus and anomalus) are perhaps several Vitrinellæ. Similar forms are also known from the Eastern Seas. It is probable that the existing species are extremely numerous, though the individuals are few. Although many of the Mazatlan specimens were perfectly fresh from their native haunts, not a trace of operculum was found. Of the described species, four are shewn by the types in Mr. Cuming's collection to be common to Panama and Mazatlan;† fourteen appear now for the first

* Dr. Gray proposes to alter the name of this latter genus to *Vitrinula*.

† Besides these may be seen in the Cumingian collection types of V. valvatoides and Teinostoma minutum from Panama; and V. tincta, V. interrupta and Ethalia megastoma from Jamaica. The latter, along with a young Natica ? canrena, were found with the specimen of V. interrupta. The indented species, ranked with this genus by its author on account of their texture, accord better with Ethalia or Teinostoma, and do not display the characteristic difference between the earlier and later whirls.

time; seven are only known from Panama, and four from Jamaica. They are all of exquisite beauty.

295. VITRINELLA PANAMENSIS, *C. B. Ad.*

V. t. subdiscoideâ, majore, solidiore, albâ; anfr. iv. *et dimidio, quarum pæne duo normales; anfr. primis lævibus, postea peutegonatis; carinâ maxime prominente vix super suturam impressam; carina satis prominente in spirâ, alterâ sub peripheriam; quartâ minus prominente in basi, quintâ umbilicum maximum circumeunte; supra et infra inter carinas clathratis, clathris (circiter* xxii.*) subconcavis, interstitia quadrata, profunda formantibus; totâ superficie et umbilico elegantissime spiraliter striatâ, striis clathris superantibus; aperturâ vix rotundatâ, a carinis angulatâ, peritremati continuo, inter duas carinas anfr. penult. attingente, labro sinuato, postice expanso.*

C. B. Ad. Pan. Shells, no. 263, pp. 187, 316.

One very fine specimen only was found of this (for the genus) large species, which has allowed of a description somewhat more in detail than that of Prof. Adams, who did not note the very characteristic spiral striæ. It is rather more elevated than V. parva, with an additional keel and deeper pits. *Long.* ·03, *lat.* ·065 by ·057, *div.* 160°.

Hab. — Panama; 24 sp. in sand; *C. B. Adams.* — Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1146 contains the specimen.

296. VITRINELLA PARVA, *C. B. Ad.*

V. t. discoidali, spirâ planatâ, anfractibus iv. *et dimidio, supra et infra monstrantibus; clathris quadratis, solidis, transversis instructâ, plus minusve distantibus,* xiii. *ad* xxii., *a carinis spiralibus decussatis; anfractibus junioribus lævibus, postea quadrigondtis; carinis duabus mediis, distantibus; angulâ tertiâ prope suturam, quartâ regionem umbilicalem circumeunte; jugo juxta suturam et cavitate inter jugum angulamque subconcavâ instructâ; peritremati ab anfractu penultimo vix interruptâ; labio angulato, undulato, postice superante.*

C. B. Ad. Pan. Shells, no. 264, pp. 187, 316.

Vitrinella clathrata, *P. P. C. Cat. Prov.*

The Panama shells in Cuming's collection have the transverse bars much more numerous than those from Mazatlan, and

scarcely develop the umbilical angle, the want of which in Prof. Adams' description had led me to overlook the species. It somewhat resembles V. Panamensis, and is known from the other Mazatlan forms by the stout radiating bars, crossed by two central keels, on which the shell will stand without support. There is also an angle at the shoulder, and a fourth bounding the large umbilical region. The shoulder angle projects so as nearly to conceal the spire. Close to the suture is a swelling ridge, with a depression between it and the angle. This part is wrinkled, not always so as to correspond with the bars, which are variable both in number and prominence. The lip does not always end with a bar. The lip is waved as in Adcorbis, but the texture is semidiaphanous, porcellanous white, as in Vitrinella. The mean divergence, if the shoulder angle were rounded off, would be about 170°. *Long.* ·02, *lat.* ·05, by ·037.

Hab.—Panama: 13 sp. in sand; *C. B. Adams.*—Mazatlan; more than 30 sp. off Chamæ and Spondyli; *L'pool Col.*

Tablet 1147 contains 5 sp. exhibiting the extremes of age and sculpture.

297. ? VITRINELLA DECUSSATA, *n. s.*

? V. t. subelevatâ, turbiniformi, tenui, albâ, porcellanâ; anfractibus iv. *et dimidio, rotundatis, quarum* iii. *primi læves seu spiraliter striati sunt, subito in superficiem decussatam mutantes; clathris extantibus quoad* xv. *spiralibus, transversis plus minusve distantibus, interstitiis valde impressis; aperturâ, adolescente peritremati haud continuo, labio paullum in umbilico reflexo; adultâ circulari, continuo; umbilico haud parvo.*

The true position of this shell cannot be determined till the animal and operculum have been examined. But for its texture, which is that of Vitrinella, it might rank with Liotia. It is known at once by its Turbinoid shape, and by the beautiful decussation caused by prominent transverse and spiral bars. The large proportion of this shell which does not display the characteristic sculpture would favour the supposition of its being a young shell. About 30 specimens however (perfect and broken) were found, of which the greater part were of uniform size. The smallest specimen is ·022 across. The largest measures *long.* ·04, *lat.* ·045 by ·035, *div.* 115°.

Hab.—Mazatlan; very rare, off Spondylus; *L'pool Col.*

Tablet 1148 contains 4 perfect and 2 imperfect specimens, shewing variations in age and sculpture.

298. VITRINELLA MONILE, *n. s.*

V. t. subelevatâ, helicoideâ, diaphanâ, albâ ; anfr. iv. *et dimidio, convexis, quarum tres primi læves seu spiraliter substriati sunt, subito in superficiem minutissime decussatam mutantes ; liris quoad* xx. *spiralibus, transversim decussatis, interstitiis subovalibus seu subquadratis ; aperturâ spatiosâ, peritremati continuo, parum ab anfr. penult. impresso, labro ut in Ianthinâ sinuato ; umbilico anfractus intus vix monstrante, regione umbilicali valde incurvatâ.*

This species is intermediate in form between V. decussata and V. monilifera. The decussating structure, which covers the surface and enters the umbilicus, is extremely fine ; the suboval punctures (in a favourable light) appearing like rows of pearl necklaces. The adult portion rarely extends to a whirl and a half. Nearly 30 specimens were found, more or less perfect ; of which the smallest is ·023 across ; the largest measures *long.* ·035, *lat.* ·055, by ·045, *div.* about 125°.

Hab.—Mazatlan ; very rare, off Chamæ and Spondyli : *L'pool Col.*

Tablet 1149 contains 1 imperfect, and 3 perfect specimens of different ages. In one, the spiral lines suddenly become more numerous.

299. VITRINELLA MONILIFERA, *n. s.*

V. t. "V. monili" sculpturâ et indole simili, sed discoideâ, anfractibus subplanatis, decussatione tenuiore, umbilico maximo, anfractus ad apicem monstrante ; aperturâ vix continuâ, sinuatâ.

This species might without impropriety be ranked with Cyclostrema ; the apical portion however is as in Vitrinella. The mouth is scarcely altered in form by the penultimate whirl, and is sinuated as in Adeorbis. The necklace pattern is rather finer than in V. monile. *Long.* ·015, *lat.* ·04 by ·035. *Div.* about 175°.

Hab.—Mazatlan ; 7 specimens in Chama and Spondylus ; *L'pool Col.*

Tablet 1150 contains the largest and the most characteristic specimen.

300. VITRINELLA LIRULATA, *n. s.*

V. t. discoideâ, haud parvâ, anfractibus iv. *et dimidio, quarum tres insculpti, regulariter augentibus, spiraliter tenue liratis; spirâ planatâ, suturis conspicuis, aperturâ ?rotundatâ, umbilico maximo, anfractus monstrante.*

Distinguished from V. monilifera by its large size, more regular growth, and somewhat coarser spiral liræ, which are not decussated. The mouth in the only specimen found is rather broken, but it appears to have been nearly round. It gives evidence of having been a coloured shell, and may possibly be a Skenea. *Long.* ·027, *lat* ·085 by ·065, *div.* 180.

Hab.—Mazatlan; 1 dead sp. off Chama; *L'pool Col.*

Tablet 1151 contains the specimen.

301. VITRINELLA SUBQUADRATA, *n. s.*

V. t. discoideâ, albâ, seu subhyalinâ, planatâ, lævi, nitidâ; anfractibus iv. *et quadrante; interdum striâ juxta suturam impressam; umbilico maximo; anfractu ultimo prope umbilicum et infra peripheriam subangulato; aperturâ subquadratâ, anfr. penult. vix attingente, labro ad suturam et in medio valde sinuato, postice dilatato, excurvato.*

In shape like V. monilifera, but without sculpture. Though smooth, the junction of the adult portion (one whirl and a quarter) is clearly marked. The aperture is beautifully sinuated in the middle and at the suture, with the labrum much excurved between the two. The smallest specimen is ·025 across. The largest measures *long.* ·017, *lat.* ·04 by ·033. *Div.* about 175°.

Hab.—Mazatlan; 16 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1152 contains 4 sp. differing in age and texture.

302. VITRINELLA BIFILATA, *n. s.*

V. t. subdiscoideâ, anfractibus iv. *et dimidio, rotundatis; anfractu ultimo tenuissime spiraliter striato, striis duabus, juxta et supra peripheriam majoribus; umbilico maximo; aperturâ vix anfr. penult. attingente, vix subquadratâ, labro ad suturam et in medio sinuato, postice excurvato.*

Differs from V. lirulata in the fineness of the sculpture, tumidity and comparative elevation of the spire, and in the development of two striæ above the rest. Of these, the larger

continues the subsutural line; and the other, which is most conspicuous on younger shells, being often nearly evanescent in larger specimens, appears on the spire. The labrum in this species also resembles Adeorbis; and in one specimen is slightly thickened, producing a few varical ridges near the aperture. Another has the ultimate whirl abnormally depressed. *Long.* ·025, *lat.* ·055 by ·045, *div.* 160°.

Hab.—Mazatlan; 4 perfect and 4 broken specimens off Chama and Spondylus; *L'pool Col.*

Tablet 1153 contains a beautifully perfect specimen, and a larger one with the varical mouth.

303. VITRINELLA BIFRONTIA, *n. s.*

V. t. subdiscoideâ, subdiaphanâ, nitente, pulcherrimâ, anfractibus iv. *et dimidio: carinis duabus lævibus, maxime prominentibus, angulatis, spiralibus, quarum una infra, una supra peripheriam sitæ sunt; carinâ tertiâ inter eas, ad peripheriam, parum conspicuâ; carinâ quartâ posticâ, haud prominente, prope suturam valde impressam, in spirâ decurrente; ad umbilicum maximum angulatâ, haud carinatâ; basi subplanatâ, striis duabus spiralibus, intus quadratim decussatis, extus decussatione remotiore ornatâ; ad spiram striis incrementi irregularibus, rugulis intus umbilicum subcrenantibus; aperturâ quadratâ, à carinis angulatâ, haud nisi ad carinam basalem anfr. penult. attingente; spirâ subplanatâ, anfr. ult. decumbente.*

Variat carinulis spiralibus prope suturam intercalantibus.

Variat quoque ad basim, striis spiralibus vix monstrantibus, rugulis usque ad peripheriam æqualiter radiantibus.

In the form of the base and aperture and the wrinkles of growth, this species resembles Solarium: in its two prominent keels and scarcely united whirls it has relations with Bifrontia, (Omalaxis, *H. & A. Ad. Gen.* i. 244,) first discovered in a living state by the indefatigable zeal of R. M'Andrew, Esq. The medial keel does not project beyond the upper and lower ridges: the posterior keel is between the lower keel and the suture. The adolescent portion, which is as usual nearly smooth, though angulated at the spire, is almost concealed by the penultimate portion; the last whirl however descends as in Delphinula, only touching by the anterior keel. The base is normally ornamented with two spiral lines, decussated in squares between; with rarer decussating lines on the outer por-

tion, and closer wrinkles entering the umbilicus. On one (dead) specimen however the radiating rugæ are coarse, not interrupted by spiral lines; the periphery also is more adherent to the penultimate whirl. Four (perfect) specimens only were found of this exquisitely beautiful species. *Long.* ·02, *lat.* ·052 by ·043. *Div.* about 170°.

Hab.—Mazatlan: off Spondylus calcifer, extremely rare; *L'pool Col.*

Tablet 1154 contains one specimen.

304. VITRINELLA PERPARVA, *C. B. Ad. var.* NODOSA.

V. t. discoideâ, planatâ, quadratâ, subhyalinâ; carinis duabus spiralibus infra et supra peripheriam planatam, quarum postica nodosa ad marginem spiralem est; basi rugulis radiantibus distantibus ornatâ; carinâ parum expressâ regionem umbilicalem magnam circumeunte; aperturâ quadratâ; anfr. ult. haud declivi.

Pan. Shells, no. 265, pp. 187, 316.
V. nodosa, *P. P. C. Cat. Prov.*

The characteristic coronation of the upper keel is not mentioned by Prof. Adams; it is however very conspicuous in the specimen sent to Mr. Cuming. It is possible that the specimen he described is another species, in which case the name which I had given may be retained for this. It closely resembles in outline a smooth, crenated Dundry Ammonite. In Mr. Cuming's specimen, there are one and a half normal whirls; there also appears a slight labial deposit. The only specimen found at Mazatlan is immature, and measures *long.* ·0075, *lat.* ·033 by ·027, *div.* 175°.

Hab.—Panama; 3 sp. in sand; *C. B. Adams.*—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1155 contains the specimen.

305. VITRINELLA EXIGUA, *C. B. Ad.*

V. t. subdiscoideâ, albâ, anfractibus iv. *et triente; carinis* iii. *maximè prominentibus, acutis, angulatis, haud serratis, quarum una ad peripheriam, una antica, una postica in spirâ sitæ sunt; angulo circa umbilicum magnum plus minusve monstrante; striis exillimis spiralibus totâ superficie ornatâ; lirulis radiantibus plus minusve distantibus et infra et supra decussantibus, circa*

umbilicum et inter carinas centrales evanidis ; aperturâ à carinis angulatâ, inter duas carinas anfr. penult. attingente ; anfr. ult. plus minusve decumbente.

Pan. Shells, no. 259, pp. 184, 315.

Having written the above description (under the name of V. trigonata), a minute examination of the type specimens in Mr. Cuming's collection proves them to be identical with the Panama shell. It is remarkable that Prof. Adams has not mentioned the stout keel above the periphery, nor the crowded spiral striæ over the surface, which however are clearly marked on his specimens. If there are similar omissions in other diagnoses, it may be that some of the other species have been before described. The typical markings are with transverse riblets, about 20 to the whirl, on the outer half of the base, and between the keels on the spire : but in one specimen are nearly double that number. The spiral striæ are over the whole surface. The keels are sharp, smooth, and extremely prominent. It is difficult to estimate the divergence, as it depends on the depression of the last whirl, which in one of the adult specimens makes the angle 150°, in the other 170°. *Long.* ·025, *lat.* ·06 by ·05.

Hab.—Panama ; 7 sp. in sand ; *C. B. Adams.*—Mazatlan ; 2 adult and 4 young sp. off Spondylus and Chama ; *L'pool Col.* Tablet 1156 contains the most characteristic specimen.

306. VITRINELLA CORONATA, *n. s.*

V. t. "*V. exiguæ*" *simili, sed discoideâ, striis spiralibus nisi in umbilicum nullis, seu evanescentibus ; basi prope umbilico valde angulato ; carinâ mediâ maxime extante ; rugis radiantibus, in juniore valde extantibus, intus carinam basalem, et supra spiram, carinam posteriorem in spirâ superantibus, quasi coronantibus.*

The distinguishing radiating rugæ which cross the keel on the spire and give it a serrated or coronated appearance are very conspicuous on the young shell ; but, along with those on the base, they become evanescent as the shell arrives at maturity. The species is further distinguished from V. exigua by the absence of spiral striæ except in the umbilicus ; and from both this and V. tricarinata by its extremely depressed growth, the upper keel completely hiding the spire. Only one perfect and 3 imperfect specimens were found. *Long.* ·02, *lat.* ·055 by ·045, *div.* 185°.

Hab.—Mazatlan; extremely rare, off Spondylus and Chama; *L'pool Col.*

Tablet 1157 contains the perfect specimen, and the youngest, with the rugæ conspicuous. The other two specimens found were intermediate between these extremes.

307. ?VITRINELLA ANNULATA, *n. s.*

?V. t. subglobosâ, solidiore, opacâ, albâ, anfractibus iv. *et triente; spirâ haud depressâ, lævi; carinâ spirali ad peripheriam conspicuâ, rotundatâ; carinis duabus minoribus, acutis, quarum altera umbilicum satis magnum definat, altera intermedia est; aperturâ subrotundatâ, à carinis subangulatâ, anfr. penult. parum attingente; suturâ subimpressâ; striis nonnullis spiralibus in spiram monstrantibus.*

This shell is somewhat solid and globose for the genus; and the nuclear portion not being clearly defined in the solitary specimen found, its position is doubtful. It is easily recognized by the rounded, annular keel on the periphery, with two somewhat sharp ones on the base, the latter bounding the umbilical region. *Long.* ·027, *lat.* ·052 by ·047, *div.* 150°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 1158 contains the specimen.

308. VITRINELLA CINCTA, *n. s.*

V. t. subglobosâ, albâ, anfractibus iv. *tumidis; carinis duabus majoribus, acutis, haud valde prominentibus, haud distantibus, utroque latere peripheriæ planatæ spiraliter cingentibus; duabus quoque in basi minoribus ab umbilico profundo, haud expanso, et peripheriâ æquidistantibus; spirâ subplanatâ; striis passim spiralibus; aperturâ à carinis angulatâ, anfr. penult. parum attingente; regione inter umbilicum ipsum et carinam profunde concavâ; anfractu ultimo parum declivi.*

The two principal keels are much closer and less prominent than in V. bifrontia. In the base it resembles V. annulata, but the spiral portion is quite different, being flattened, with very numerous spiral striæ. The whirls do not enlarge rapidly. The umbilicus itself is somewhat narrow, with a broad funnel leading down to it from the nearest keel. The labium is somewhat reflexed over it. *Long.* ·02, *lat.* ·034 by ·028, *div.* 170.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1159 contains the specimen.

309. VITRINELLA CARINULATA, *n. s.*

V. t. subglobosâ, subdepressâ, tenui, subdiaphanâ; suturâ impressâ; umbilico haud magno; regione umbilicali magnâ, concavâ, radiatim rugosâ; anfr. ult. carinulis v. *haud prominentibus, quarum duæ infra et supra peripheriam haud planatam sitæ sunt, duæ in spirâ haud planatâ, altera regionem umbilicalem describens; sulcis spiralibus in basin, carinulis simulantibus; aperturâ subelongatâ, ad basim angulatâ, anfr. penult. parum attingente.*

Known from V. cincta by the non-prominence of the keels, rounding and keeling of the spire, and greater elevation. The only specimen found is not mature, scarcely a whirl being formed of the adult portion. *Long.* ·22, *lat.* ·03 by ·023. *div. circ.* ·165°.

Hab.—Mazatlan; 1 sp. off. Spondylus; *L'pool Col.*

Tablet 1160 contains the specimen.

310. ?VITRINELLA NATICOIDES, *n. s.*

? V. t. subglobosâ, subdepressâ, nitidâ, subdiaphanâ, albâ; anfractibus iv. *et triente, quarum primi convexiusculi sunt, ultimi suturâ vix impressâ; striulis incrementi exillimis, maxime suturam versus, haud conspicuis; umbilico profundo, angusto, à carinâ extante callosâ definitâ; aperturâ anfr. penult. parum attingente, labio subexpanso, à carinâ angulato.*

This curious shell might be either called by the above name or Natica vitrinelloides, as it partakes of the characters of both genera; though the texture and difference of convexity in the first three whirls incline the balance in favour of the former genus. Thus the shell alone cannot decide between animals widely removed. It looks like a flattened, white, glossy Natica, with the straight umbilicus bounded by a conspicuous keel which runs into the aperture. *Long.* ·03, *lat.* ·047 by ·04, *div.* 160°.

Hab.—Mazatlan; 2 sp. off Spondylus & Chama; *L'pool Col.*

Tablet 1161 contains the largest specimen.

311. ?VITRINELLA PLANOSPIRATA, *n. s.*

? V. t. magnâ (quoad genus), tenuissimâ, subdiaphanâ, albâ; spirâ planatâ, ad carinas valde angulatâ, spiraliter striatâ; ad basim tumente, convexâ, profunde sed non late umbilicatâ;

basi et umbilico spiraliter liratis; ad peripheriam carinâ acutâ, prominente, alterâ spiram ascendente, minus prominente; inter eas suturâ valde impressâ; aperturâ anfr. penult. vix ad carinam attingente.

This very remarkable shell has the general appearance of Helix (Iberus) Gualterianus. It has however two keels, (that on the spire being less prominent) and a deep rather narrow umbilicus. The whirls rapidly increase in size both in breadth and thickness. The generic position is doubtful, the only specimen found having lost the greater portion of the last whirl. The general aspect and texture are like a very large Vitrinella, and the usual unformed portion is clearly defined, being much larger than in the typical species; it differs however in the comparative length of the adult part, which must have consisted of at least two complete whirls. The shell when perfect may have been ·2 in length: the penultimate whirl measures *long.* ·03, *lat.* ·04 by ·025, *div.* 180°.

Hab.—Mazatlan; 1 broken specimen off Spondylus calcifer; *L'pool Col.*

Tablet 1162 contains the specimen.

312. ?VITRINELLA ORBIS, *n. s.*

?V. t. discoideâ, diaphanâ, hyalinâ; valde complanatâ, spirâ planatâ, basi subplanatâ; ad peripheriam rotundatam, et intus umbilicum apertissimum, striis spiralibus paucis, plus minusve impressis; infra et supra lævi, interdum striâ spirali juxta suturam haud impressam; anfractu ultimo penultimum parum attingente; aperturâ angustâ, spiraliter elongatâ, subquadratâ; labro sinuato, postice producto.

This singular species has relationship to Discohelix, *Dkr. Palæont.* i. 132, = Orbis, *Lea*; of which, as of Vitrinella, the animal is unknown, being classed with Littorinidæ by *Phil. Handb. Conch.* p. 174, but with Architectonicidæ by *H. & A. Ad. Gen.* i. 244. It has the appearance of the common flat Dundry Ammonites, with the periphery rounded and spirally striated. A beautifully perfect specimen, quite transparent, but probably immature, was found inhabiting the spiral portion of a dead Isapis maculosa, the mouth of which had been choked up with coralline, among the debris of a Spondylus. It measures *long.* ·0075, *lat.* ·033 by ·027, *div.* 180°. Three other broken specimens were found on Chamæ.

Hab.—Mazatlan; extremely rare, on Chama and Spondylus; *L'pool Col.*

Tablet 1163 contains the perfect specimen.

Genus ?LIOTIA, *Gray*,

Syn. B. M. 1840.—*H. & A. Ad. Gen.* vol. i. p. 404.—*Phil. Handb. Conch.* p. 206.

Delphinula, pars, *auct.*

The following shells are ranked doubtfully with this genus, not having the expanded lip of the typical species, and the opercula being unknown.

313. ?Liotia carinata, *n. s.*

?L. t. solidâ, cinereâ, rufo tinctâ; spirâ depressâ, anfractibus iv. *supra subplanatis, suturâ distinctâ, angulatâ; carinis* iv. *extantibus circa peripheriam; liris spiralibus* iii. *in spirâ, nodulosis;* iii. *in basi rotundatâ, haud extantibus; circa umbilicum magnum radiatim rugoso-nodosâ; aperturâ intus circulari, anfr. penult. parum attingente; anfractu ultimo valde decumbente.*

Shell comparatively solid and opaque; it may be young, but from the small size of the nuclear portion and the sudden declension of the last whirl, it is presumed to be nearly mature. *Long.* ·03, *lat.* ·015 by ·01, *div.* (anfr. penult.) 175°.

Hab.—Mazatlan; 1 sp. on Spondylus; *L'pool Col.*

Tablet 1164 contains the specimen.

314. ?Liotia striulata, *n. s.*

?L. t. turbiniformi, spirâ subelevatâ, albidâ, solidâ; anfractibus iii. *rotundatis, radiatim exillime et confertissime striulatis, carinis parum extantibus* iii. *spiralibus; umbilico magno; in basi interdum rugis radiantibus; aperturâ declivi, solidissimâ, intus rotundatâ, anfr. penult. parum attingente.*

The thickness of this little shell is extraordinary, being at the posterior portion of the aperture nearly ·005 in. The whirls are rounded, obscurely carinated, and most minutely and closely striated in the direction of growth. *Long.* ·027, *lat.* ·037 by ·03, *div.* 130°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1165 contains the specimen.

315. ?? Liotia C-B-Adamsii, *n. s.*

?? L. t. tenuissimâ, diaphanâ, albâ; turritâ, anfractibus iii. *tumentibus, superne subangulatis; liris radiantibus (in anfr. ult.* xxii.*) à lirulis spiralibus circiter* viii. *nodulosis elegantissime cancellatis; anfr. primo et dimidio lævibus, tumentibus; liris radiantibus in basi evanescentibus; umbilico parvo; aperturâ subcirculari, peritremati continuo, ab anfr. penult. vix interrupto.*

Although this is clearly a young shell, its characters are so well marked and distinct from any other known Mazatlan species, that it has been thought best to preserve a remembrance of its beauty in connexion with the name of the most accurate and deeply lamented Prof. C. B. Adams. It has the texture of Vitrinella, but is distinguished by its turrited form, and by the large size and short length of its apical portion, which occupies a whirl and a half, instead of three minute whirls as is customary in that genus. The rest of the shell is beautifully decussated by radiating liræ, obsolete on the base, knotted by revolving lirulæ, three of which appear on the base. Both labrum and labium are extremely thin. It may possibly belong to Rissoidæ. *Long.* ·024, *lat.* ·022, *div.* 70°.

Hab.—Mazatlan; 1 young sp. off Spondylus; *L'pool Col.*

Tablet 1166 contains the specimen.

316. ? Liotia ————, *sp. ind.*

Tablet 1167 contains a fragment of a somewhat elevated shell, with the apex flattened. The first whirl is large and smooth as in ?? L. C-B-Adamsii; but the sculpture is extremely strong, with stout transverse tubercular ridges and spiral decussating liræ. It is distinguished from Chrysallida by the flat, dextral apex.

Hab.—Mazatlan; 1 sp. off Spondylus: *L'pool Col.*

Genus GLOBULUS, *Schum.*

Schumacher, Essai &c. 1817, no. 23 ? (non *Sow.*).—*Phil. Handb. Conch.* p. 208.
Rotella, *Lam.* 1822, et auct.
Umbonium, *Link; A. Ad. Mon.* in *Proc. Zool. Soc.* 1853, p. 187:—*H. & A. Ad. Gen.* vol. i. p. 407.
Pitonellus, *Montf.*
Helicina, *(Lam.* à primâ manu) *Gray* in *Proc. Zool. Soc.* 1847, p. 145.

317. ?Globulus tumens, *n. s.*

? G. t. globosâ, solidiusculâ, albâ, subnitente; spirâ planatâ, depressâ, anfractibus iv. *suturâ haud impressâ; striulis spiralibus subobsoletis tenuissime ornatâ; callositate valde tumente, trientem partem basis tegente, suturâ impressâ, umbilicum tegente, in parietem et intus suturam spiralem ascendente, juxta labium vix planatum; aperturâ intus rotundatâ, labro in spiram ascendente.*

This species is intermediate between the typical Globuli and the Ethaliæ. In the faint sculpture and slight planing off of the callosity, it presents the characters of the latter genus; in the large swelling growth of the callus, which appears glossy over the whole surface, and covers the body whirl within the mouth, running up to the suture, it is a true Globulus. Two older specimens were found, sufficiently agreeing in other respects, but displaying a groove in the callus near the base of the columella, exactly in the same place, which is remarkable if accidental. They are both however worn specimens. If it should prove a constant character, they may take the name of "G. sulcatus, *t. callo basim versus sulprofunde sulcato.*" *Long.* ·013, *lat.* ·038 by ·033, *div.* 160°.

Hab.—Mazatlan; 3 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1168 contains the fresh specimen, and one of the form G. sulcatus.

Subgenus ETHALIA, *H. & A. Ad.*

Gen. vol. i. p. 409:—*Proc. Zool. Soc.* 1853 *(Mon. Umb.)* p. 189.

A small group of Mazatlan shells, of the general aspect of Vitrinellæ, and agreeing with Globulus in having a callous base,

differ from the typical species of that genus (1) in being frequently sculptured, (2) in the callus winding round, generally not covering the umbilicus, (3) in the outside of the callus not being glossy, but having a glossy portion scooped out near the columella. The labium is generally not reflected over the body whirl. They appear to retain permanently the young state of Teinostoma. At the same time, the specimens examined were so few (only 9 of 5 species) and some of these were to such an extent intermediate between other groups, that it is impossible to designate them with confidence. Some of the small white shells described as Rotellæ are probably referable to this form. Mr. Cuming states that the species he found were deep water shells, while the true Globuli are littoral.

318. ETHALIA PYRICALLOSA, *n. s.*

E. t. valde depressâ, albidâ, opaciore ; anfractibus iv. *et dimidio, quarum tres primi læves sunt, suturâ haud impressâ ; striis spiralibus tenuibus, rugulisque incrementi tenuissimis elegantissime ornatâ ; callositate opacâ radiatim rugosâ circa umbilicum parvum gyrante, juxta labium planatâ, pyriformi ; aperturâ subovatâ, labro tenui, intus suturam vix callosâ ; labio in anfractu penultimo haud expanso.*

This extremely elegant and characteristic shell agrees with Vitrinella in the nature of the apex ; but differs in the revolving callus, which is not covered with the spiral striæ, but radiately wrinkled ; at the aperture it is suddenly planed off, displaying a pyriform shape. *Long.* ·019, *lat.* ·047 by ·037, *div.* 160°.

Hab.—Mazatlan ; 1 sp. off Spondylus ; *L'pool Col.*

Tablet 1169 contains the specimen.

319. ETHALIA LIRULATA, *n. s.*

E. t. depressâ, albâ, opacâ ; anfractibus iv. *quarum primi læves sunt, suturâ haud impressâ ; striis spiralibus tenuibus confertissimis ; callositate opacâ, circa rimulam umbilicalem gyrante, juxta labium planatâ, latâ, subtrigonâ ; aperturâ obovali ; labro tenui, infra suturam minime callosâ ; labio in pariete nullo.*

Known from E. pyricallosa by the compact growth, close striæ without transverse wrinkles, and short broad callus

which covers the umbilicus, leaving only a slight chink. A second sp. agrees in all respects except that the spiral sculpture is coarse and somewhat moniliform; but it is too much weathered to decide on its affinities with confidence. *Long.* ·019, *lat.* ·039 by ·034, *div.* 153°.

Hab.—Mazatlan; 2 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1170 contains the typical specimen.

320. ETHALIA PALLIDULA, *n. s.*

E. t. globosâ, solidâ, albâ; ad spiram planatâ, ad basim productâ; anfractibus iii., *suturâ indistinctâ, apice planatâ; totâ superficie striis spiralibus subrugulosis impressâ; callositate minimâ; umbilico nullo; aperturâ elongatâ, ad basim subangulatâ; labro acutiore, labio conspicuo.*

A little globular shell, produced at the base of the columella, and presenting the general aspect of the young of Lacuna pallidula. It is on the extreme verge of the genus, the compact spire preventing the development of the callus. *Long.* ·029, *lat.* ·044 by ·035, *div.* 170°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1171 contains the specimen.

321. ETHALIA CARINATA, *n. s.*

E. t. discoidali, planatâ, aurantio-fuscâ; anfractibus iv. *et dimidio, quarum* iii. *primi læves, vix amplectentibus, suturâ valde impressâ; sub peripheriam acute carinatâ; totâ superficie rugulis incrementi confertissimis ornatâ; regione umbilicali concavâ; callositate spirali elongatâ, angustâ, rimam conspicuam umbilicalem gyrante, juxta labium parum planatâ; aperturâ subquadratâ, sinuatâ, à carinâ angulatâ; labio ad parietem nullo; labro intus suturam parum calloso.*

This charming little shell has the general aspect of Planorbis carinatus, but with the whirls a very little elevated, and the keel just below the centre. The whirls very slightly embrace, but are cemented by the long, thin callus. Both above and below, it is covered with extremely close, rugulous, radiating striulæ. In its mode of growth it affords a transition to Teinostoma. *Long.* 013, *lat.* ·038 by ·033, *div.* 175°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1172 contains the freshest (but smallest) specimen.

322. ETHALIA AMPLECTANS, *n. s.*

E. t. minimâ, planatâ, diaphanâ, nitidissimâ; anfractibus iii, *planatis, peritremati rotundato; callositate haud parvâ, umbilicum vix tegente, juxta labium planatâ, semilunatâ; labro acuto, supra anfractum penultimum dilatato; infra suturam haud impressam callositate, suturam fallacem extus simulante; aperturâ rotundatâ.*

As it is barely possible that this shell may be the young of Teinostoma amplectans, the same specific name has been given. It differs however in the much smaller size of the callosity, which in this shell displays a broad, semi-lunate planation at the columella, which appears characteristic of the species. *Long.* ·016, *lat.* ·04 by ·032, *div.* 180°.

Hab.—Mazatlan; 4 sp. off Spondylus; *L'pool Col.*

Tablet 1173 contains the freshest specimen.

GENUS TEINOSTOMA, *A. Ad.*

Proc. Zool. Soc. 1853, p. 183.—*H. & A. Ad. Gen.* vol. i. p. 122.

Testa spirâ depressâ, politâ, anfractibus rapide augentibus; regione umbilicali callosâ; aperturâ productâ, elongatâ, ab axi remotâ; interstitio calloso; peritremati axin versus rotundato, ad peripheriam interdum angulato.

Shell Rotelloid, with a greatly produced mouth and callus. It resembles Cyclops among the Nassidæ, and in the appearance of the base reminds the observer of Streptaxis and Anostoma among the Helicidæ. Having been described (in English only) from a single species (T. politum, St. Elena, 8 fm. *Cuming,*) some of the characters before given may hereafter prove to be only specific.

323. TEINOSTOMA AMPLECTANS, *n. s.*

T. t. parvâ, albâ, planatâ, lævi; peritremati rotundatâ; callositate spirali umbilicum tegente, labium versus subplanatâ, supra parietem intus suturam decurrente; aperturâ rotundatâ; labro supra anfractum penultimum reflecto; suturâ haud impressâ.

Although the shells described above as Ethalia may possibly be the young of this species; yet, as they were all of the same

size, and there were no intermediate specimens, I have not ventured to affiliate them. It differs from T. politum in the absence of sculpture, (which however would hardly be detected, even under the microscope, without the description,) in the greater reflection of the labrum over the spire, and in the very much smaller size. *Long.* ·05, *lat.* ·11 by ·07, *div.* 180°.

Hab.—Mazatlan; 1 sp. and fragment off Spondylus; *L'pool Col.*

Tablet 1174 contains the specimen.

324. TEINOSTOMA SUBSTRIATUM, *n. s.*

T. t. minimâ, planatâ, opacâ, albâ, subnitente; striulis spiralibus prope suturam impressam monstrantibus; callositate angustissimâ, longiore, circa rimam umbilicalem gyrante, propo labium vix planato; aperturâ rotundatâ; labro solido, anfr. penult. haud amplectante.

This tiny species is known from T. amplectans by the outer lip not being reflected over the spire, which clearly displays the substriated whirls. The callosity is long, but narrow, and scarcely planate at the aperture. A fragment has the suture less impressed. *Long.* ·016, *lat.* ·043 by ·032. *div.* 170°.

Hab.—Mazatlan; 1 sp. (not quite perfect) and a fragment; *L'pool Col.*

Tablet 1175 contains the specimen.

325. TROCHUS ———, *sp. ind.*

Tablet 1176 contains a fragment of a white shell, tuberculous, with the basal keel smooth; found in additional materials after the genus had been completed.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 1177 contains an operculum not affiliated to any known multispiral species. (That of species 291 is however unknown.) It is light horn-coloured, extremely thin, with only about 10 whirls; margin irregular; scar lateral.

Tablet 1178 contains 2 worn, small, strong, Turbinoid opercula, remarkable for the number of whirls, there being at least 10 in a diameter of ·046.

Tablet 1179 contains 2 rubbed operc̀ula, which may have been washed up from young Callopoma saxosum.

Tablet 1180 contains a shelly operculum (apex broken) which must have had about 10 whirls in a diameter of ·45; outside nearly smooth, convex; inside very concave, with the margins of the whirls projecting, and beautifully crenated.

Hab.—Mazatlan; from shell washings; *L'pool Col.*

Family NERITIDÆ.

Genus NERITA, *Linn.*

Odontostoma, *Klein*, non *D'Orb.*, nec *Phil.*

326. Nerita scabricosta, *Lam.*

An. s. Vert. vol. viii. p. 608, no. 14.—*Récl.* in *Petit Journ. Conch.* vol. i. pp. 287, 410, pl. 11, f. 2.—*C. B. Ad. Pan. Shells*, p. 204, no. 304.—(Non *Deless.* in *Rec.*)

=N. fornata, *Sow. Gen.* pl. 4, f. 4.—*Wood, Ind. Test. Suppl.* pl. 8, f. 4.—*Rve. Conch. Syst.* pl. 202, f. 4.—*Phil. Abbild.* p. 1, pl. 1, f. 2, 3.—*Mke.* in *Zeit. f. Mal.* 1850, p. 167, no. 21.—*Rve. Conch. Ic.* pl. 1, f. 3, *a*, *b*.

+N. Deshayesii, *Récl.* in *Rev. Zool.* 1841, p. 184.—*Rve. Conch. Ic.* pl. 2, f. 7, *a*, *b*.

+N. multijugis, *Mke.* in *Zeit. f. Mal.* 1847, p. 179, no. 7, (teste *Mke.* ipso, loc. cit. 1850,)—*Rve. Elem. Conch.* pl. 16, f. 86.

=Pila multijúgis + P. ornata + P. scabricosta, *H. & A. Ad. Gen.* i. 379, 380.

The N. ornata of *Sow.* is referred to the N. scabricosta of *Lam.* on the undoubting authority of Prof. Adams. The original description (from a supposed unique specimen,) might fit many species; and *Desh.* (who was debarred by *Kien.* from inspecting the Lamarckian types, even when editing the *An. s. Vert.*) does not venture on synonyms. The N. multijugis of Menke, described from adolescent specimens, was abandoned by himself, and yet appears in modern works as distinct. The form N. Deshaysii, (to which most of the Mazatlan specimens belong) is separated in consequence of having more numerous

spiral ribs, a taller spire, and a yellow mouth. These characters do not always go together, and are each extremely variable, as are also the rugæ on the columellar lip, it being difficult to find two specimens exactly alike. The fineness of the ribs sometimes differs in different parts of the same shell. The colour within presents all shades from a brilliant orange to pure white. The sharp labral margin, (crenulated by the ribs,) is either black throughout, or tessellated with light between the ribs. Spire always more or less eroded, even in young specimens, which in this collection were extremely rare. These are known from the next species by the non-granular lip (smooth in the youngest specimen,) strong teeth, and raised spire. Costæ often scarcely scabrous. Labrum thickly callous within the margin, dentate, with very strong teeth at the extremities. Rugæ often continued on the spire, beyond the flattened columella. Operculum (in both the forms N. ornata and N. Deshayesii) outside finely granular, with an obscure spiral line marking off about a quarter of the shell from the outside, and ending in a deep sinus on the inner margin. Tooth stoutly projecting, curved downwards opposite the not inconspicuous spiral apex. Colour orange brown. A few were found loose, with the spiral line scarcely developed, and of a more ashy colour. As there was no other large species of Nerita among the shells, these are presumed to be of abnormal growth. The following shells, selected from but a small stock, exhibit the principal variations in the wrinkling near the second of the four teeth: to display all the minute differences would have been to retain almost every specimen. The shells are not nearly so large as further down the coast; the largest measuring only *long.* 1·11, *lat.* 1·18, *div.* 110°—120°.

Hab.—Is. of Timor; sp. typ. Lam. teste Recluz. [?]—Real Llejos, Sowerby.—Panama; very common, on rocks, especially in crevices, between high water and three-quarter tide; young crawling above high water mark on rocks and stones wet with spray; *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; not common; *L'pool & Havre Coll.*

Tablet 1181 contains 4 sp. of different ages: the smallest, ·48 across, displays an orange spire, smooth at the apex, with distant ribs, intercalary ones appearing at the margin.—1182, 1 sp. ribs distant, form ornata.—1183, 1 do., ribs changing, in part very close, form Deshayesii.—1184, 2 sp. displaying coloured lip; one with a single orange spot, the other richly tinted, inside and out, with spire abnormally elevated.

Specimens displaying changes of wrinkles.—Tablet 1185 contains 2 sp. cross-barred, or T-shaped.—1186, 3 sp. curled round, P- or B-shaped.—1187, 2 sp. 7-shaped.—1188, 2 sp. obscurely F-shaped.—1189, 2 sp. V-shaped.—1190, 1 sp. :-shaped.—1191, 2 sp. wrinkles very slightly developed.

Tablet 1192 contains 3 abnormal opercula. Normal ones are seen with the shells.

327. NERITA BERNHARDI, *Récl.*

Petit, Journ. Conch. 1850, vol. i. p. 285.—*Rve. Conch. Ic.* pl. 12, sp. 57, f. 57, *a, b.*

=Nerita funiculata, *Mke.* in *Zeit. f. Mal.* 1850, p. 169, no. 22, (dated "April, 1851.")

? =Nerita, sp. ind. *a, C. B. Ad. Pan. Shells*, p. 205, no. 305.

Theliostyla Bernhardi, *H. & A. Ad. Gen.* i. 380.

This unpretending, but not inelegant species represents on the Pacific coast the common W. Indian N. tessellata; from which it differs in the more numerous spiral ribs and columellar granules, and in the irregular style of painting. Shell very variable; with the spire not a little exserted, or quite flat, the expanded labrum very rarely even projecting beyond. Ribs more or less numerous, generally scabrous, sometimes nearly smooth; on shells of the same size, they vary from 2 to 5 in the tenth of an inch. Colour black, very irregularly spotted with a variable number of granules, sometimes large, sometimes small: teeth 4, very small and central, sometimes running into lines on the lip, sometimes conspicuous, sometimes nearly obsolete. Operculum ashy, very finely shagreened outside, with a horny layer outside the outer edge, and an inner sinus nearer the middle than in the last species. Tooth scarcely recurved. The largest specimen measures *long.* ·54, *lat.* ·59, *div.* 120°—180°.

Hab.—Peru, *Cuming.*—Panama; in extreme profusion, on rocks and stones from half-tide level to the low water mark of neap-tides; *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 1193 contains 7 sp. various ages.—1194, 7 do. shewing variations in colour.—1195, 6 do. varying in height of spire.—1196, 6 do. young, shewing variations in sculpture.—1197, 6 do. varying in closeness of ribs.—1198, 10 do. shewing changes in the labial teeth and granulations.—1199, 6 separate opercula; others being in the shells.

Genus NERITINA, *Lam.*

Neritella, *Humph.*—*H. & A. Ad. Gen.* vol i. p. 380.

328. Neritina cassiculum, *Sow.*

Couch. Ill. f. 55.—*Thes. Conch.* p. 521, no. 47, pl. 115, f. 194.—*Mke.* in *Zeit. f. Mal.* 1850, p. 116, no. 19.—*H. & A. Ad. Gen.* i. 382.

Comp. N. faba, *Sow. Thes. Conch.* p. 530, no. 78, pl. 115, f. 219—221.—*Conch. Ill.* f. 10.—(=Clithon f. *H. & A. Ad. Gen.* i. 385.)

Comp. Neritina Californica, *Rve. Conch. Ic.* pl. 4, sp. 20, f. 20, *a*, *b*. (Gulf of California, Mus. Cuming.)

Although picked specimens may be found so far distinct from N. picta that Messrs. Adams have placed them in different subgenera, individuals may be found in each species so nearly alike that it is not impossible that they may ultimately prove to be identical.* They display exactly the same varieties of form, although they are much more constant in colour. The differences observed are as follows. This species is larger; mouth white and stained with orange; inner lip rather flattened; teeth smaller and more irregular, more resembling those of N. virginea; operculum longer, with broader dark border, richer orange colour within, and medial line scarcely marked. If N. faba does not differ more than is stated in *Sow.*'s description, it may prove identical. He characterizes it as resembling N. picta, but having "the spire rather more hidden, and the columella neither swelled [?swollen] nor of a chesnut colour." It belongs however to another genus, teste *H. & A. Aa* Whether these and connected species in the Pacific oe really distinct from N. virginea with its many-named varieties from the Atlantic, it must be for those to judge who have examined large series from different localities. The form exists in the B. M. from China, Philippine Is., and Port Essington. It is found on the coasts of Spain and reaches Dalmatia. A regularly formed sp. measures *long.* ·68, *lat.* ·83, *div.* 120°.

A flattened	„	„	·57,	„	·72,	„ 145°.
An elevated	„	„	·73,	„	·77,	„ 90°.

* As such I have freely distributed specimens. It is not unlikely that Prof. Adams regarded them as the same. "The specimens which Lieut. Green collected are of extraordinary size." *Pan. Shells*, p. 207.

Hab.—(Unknown, Sow.)—Mazatlan, *Menke.*—Mazatlan; common, generally coated with black accretion, similar to that adhering to Strigilla carnaria, Terebra albocincta, Arca tuberculosa, &c.; *L'pool Col.*

Tablet 1200 contains 2 sp. apex sunken.—1201, 5 sp. last whirl swollen, apex appearing.—1202, 5 do. last whirl less swollen.—1203, 5 sp. normal form.—1204, 6 sp. apex more raised.—1205, 6 sp. still more.—1206, 3 do. extremely raised, mouth very slanting.—1207, 5 sp. violet tinge.—1208, 5 separate opercula; others being in their shells.

329. NERITINA PICTA, *Sow.*

Proc. Zool. Soc. 1832, p. 201.—*Desh.* in *Lam. An. s. Vert.* vol. viii. p. 588, no. 40.—*Sow. Conch. Ill.* no. 35, pl. 86, f. 1:—*Thes. Conch.* p. 530, pl, 116, f. 267-9.—*Mke.* in *Zeit. f. Mal.* 1850, p. 167, no. 20.—*C. B. Ad. Pan. Shells*, p. 206, no. 307.—*Rve. Conch. Ic.* pl. 23, sp. 101, f. 101, *a, b.*

Vitta picta, *H. & A. Ad. Gen.* i. 383.

Comp. N. Guayaquilensis, *D'Orb. Sow. Thes. Conch.* p. 520, no. 44, pl. 114, f. 177.—*Rve. Conch. Ic.* pl. 23, sp. 104, f. 103 *b.* (non *a.*)

Comp. N. Fontaineana, *B. M. Cat. D'Orb. Moll.* p. 34, no. 305. (Rio de Guayaquil.)

The variations in this species are extraordinary. Not only does it present the changes of colouring recorded below, but the form is very inconstant. Sometimes it is nearly globular, with the spire not exserted and flattened; sometimes it is much produced. Sometimes the mouth is nearly straight with regard to the axis; sometimes very slanting. Sometimes the outer lip is regular, sometimes anteriorly lengthened. The brown spot which is supposed to be characteristic of the species varies in intensity, and is scarcely seen in very young shells. It is not uncommon to find specimens whose apex betokens a different painting from that afterwards adopted; and to find shells whose back affords one pattern and the front another. The denticulation also of the inner lip varies in intensity and arrangement; so that it is difficult to assign any character, by which the whole species may be included and at the same time separated from its neighbours. The operculum is grey outside with an exterior horny layer, and a ridge near the straight

edge: within it is yellowish green, with two orange projecting teeth, one conical at the nucleus, the other spiral; with a slightly raised central spiral line. The measurements vary as in the last species; one of ordinary growth measures *long.* ·5, *lat.* ·63, *div.* 130°.

Hab.—Panama; on a mud bank partially overflowed with fresh water; *Cuming.*—Do.; on sticks and stones, in a grove of trees, a little above half tide level; also in dirty places on rocks at or a little below half tide level; strictly marine; *C. B. Adams.*—San Miguel; of extraordinary size; *Lieut. Green.*—Mazatlan, Menke.—California [?Upper] *Lady Douglass*, B. M.—"Australia; given by — Metcalf, Esq."* B. M.—Mazatlan; abundant, sometimes pierced by Gasteropods; *L'pool & Havre Coll.*

Ordinary network pattern; lilac tinge.—Tablet 1209 contains 12 specimens very close pattern.—1210, 7 do. close.—1211, 7 do. open.—1212, 5 do. very open.—*Obscurely trifasciate.* 1213, 12 do. very close.—1214, 12 do. close.—1215, 8 do. open.—1216, 6 do. very open.—1217, 6 do. colour changing.—*Grey tinge.*—1218, 3 do. extremely light.—1219, 6 do. with rows of dots.—1220, 5 do. greenish.—1221, 5 do. spotted suture.—1222, 7 do. darker.—1223, 3 do. close pattern.—1224, 5 do. obscurely trifasciate.—*Very dark colour.* 1225, 4 sp. grey tinge, very close markings.—1226, 4 do. close.—1227, 4 do. brown tinge.—1228, 4 do. purple tinge.—1229, 7 do. nearly black.—1230, 4 do. obscurely trifasciate.

Striped and zigzag pattern.—Tablet 1231 contains 8 sp. intermediate.—*Grey and olive green tinge.* 1232, 6 do. light.—1233, 9 do. with black sutural spots.—1234, 4 do. grey.—1235, 9 do. olive appearing.—1236, 5 do. dark striped.—1237, 7 do. light olive, fine streaks.—1238, 7 do. broader streaks.—1239, 5 do. dark olive, close streaks.—1240, 5 do. more distant streaks.—1241, 3 do. mottled.—1242, 5 do. grey appearing.—1243, 4 do. very close pattern.—1244, 4 do. less close.—1245, 5 do. yellow appearing.—*Lilac tinge.* 1246, 5 do. dark.—1247, 5 do. light.—1248, 7 do. yellow appearing.—*Yellow and greenish tinge.* 1249, 6 do. very light.—1250, 7 do. light.—1251, 6 do. darker.—1252, 5 do. long stripes.—1253, 2 do. broader.—1254, 7 do. large

* Several Mazatlan shells (known by their habit as well as by their species) occuring in the B. M. with the above inscription, it is probable that they were procured from the Havre Col. which was sold piecemeal at the London auctions, without any assigned habitat; and that Mr. Metcalf erroneously supposed them to have come from Australia.

sutural yellow patches.—1255, 7 do. greener.—1256, 7 do. darker.—1257, 2 do. intermediate.—1258, 5 do. close grained.—1259, 4 do. striped.—1260, 7 do. obscurely trifasciate.—1261, 4 do. dark close pattern, fine lines.—1262, 5 do. coarser lines.—1263, 7 do. mottled pattern.—1264, 5 do. obscurely trifasciate.—*Olive green tinge.* 1265, 5 do. very light.—1266, 7 do. rather darker.—1267, 7 do. greyish tinge.—1268, 5 do. darker.—1269, 7 do. very dark.—1270, 5 do. closer markings.—1271, 8 do. obscurely trifasciate.

Banded variety. Grey tinge.—1272, 7 sp. close pattern.—1273, 4 do. speckled.—1274, 6 do. band more developed.—1275, 4 do. band coloured.—*Lilac tinge.* 1276, 9 do. close pattern.—1277, 7 do. greenish band.—1278, 7 do. variable markings.—1279, 5 do. open pattern.—1280, 9 do. band margin with broad spots.—1281, 10 do. narrow spots.—1282, 8 do. with white lines.—1283, 4 do. without white.—*Greenish tinge.* 1284, 4 do. light, streaked.—1285, 5 do. spotted.—1286, 4 do. large spots.—1287, 3 do. broken markings.—1288, 5 do. large zigzag pattern.—1289, 4 do. band spotted.—*Dark colour.* 1290, 8 do. with yellow flames.—1291, 4 do. fine markings.—1292, 7 do. broken pattern.—1293, 5 do. very close grains.—1294, 7 do. very dark.

With black sutural band. Spotted. 1295, 3 sp. very light.—1296, 5 do. lilac, open pattern.—1297, 5 do. grey.—1298, 4 do. close pattern.—1299, 5 do. dark lilac.—1300, 4 do. dark grey.—1301, 4 do. very dark.—*Striped.* 1302, 4 do. very light.—1303, 9 do. olive green.—1304, 8 do. grey.—1305, 4 do. dark.—*Banded.* 1306, 5 do. lilac tinge, speckled.—1307, 6 do. grey.—1308, 4 do. striped.—1309, 3 do. lilac and green.

Tablet 1310, contains 11 sp. shewing variations in form.—1311, 18 sp. shewing variations in the mouth.—In all, 607 specimens, between every two of which there is an appreciable difference. The above enumeration gives but a faint idea of the variations, fully to display which every specimen must have been retained, and to describe which would have filled a volume.

Tablet 1312 contains 30 separate opercula; others are seen in situ.

Order PECTINIBRANCHIATA.

Suborder ROSTRIFERA.

Family VANICORIDÆ.

Genus VANICORO, *Quoy & Gaim.*

Vanikoro, *Quoy & Gaim., Voy.* à primâ manu; (postea Sigaretus seu Velutina,)—*Gray, Proc. Zool. Soc.* 1847, p. 156, no. 256.—*H. & A. Ad. Gen.* vol. i. p. 374.

Narica, *Récl.* in *Sagr. Cub. Moll.* 1836, teste *Phil. Handb. Conch.* p. 184.—"M. Récl. has the intention to form a genus," *D'Orb. Cuba,* vol. ii. p. 39: genus constituted, 1841: teste *Gray.*

Merria, *Gray, Zool. Beech. Voy.* 1839, p. 137, (anim. descr.)

Leucotis, *Swains.* 1840, Treatise, p. 346.

330. Vanicoro cryptophila, *n. s.*

V. t. parvâ, Sigaretoideâ, tenui, albidâ; nucleo anfr. iii. *quorum primus planatus, alteri subturriti, tenuissime striati, decliviter sito; anfr. normalibus* ii. *rapide augentibus, subplanatis, irregulariter striatis spiralibus creberrimis et striis incrementi, interdum his, interdum illis superantibus, tenuissime cancellatis; aperturâ valde expansâ, vix peripheriam penultimam attingente; labro elongato, labio recto; umbilico maximo; peripheriâ angustiore.*

This little creature resembles the Calyptræidæ in its sedentary habits, frequenting the burrows of worms, &c. in Spondylus and Chama valves, where its flattened form and advanced lip (in this respect resembling Trochita) allow it to live in a very narrow space. Many specimens were found in situ, but there was no trace of operculum. A minute shell of one whirl (found inside the mouth of another,) is perfectly formed, like a tumid Planorbis. Another, which was adhering over the umbilicus of an adult, is just preparing to commence the normal portion, and is shaped like a Bithinia. It then lays its spire sideways, but not always at the same angle, and begins a flattened Sigaretoid growth. The sculpture is extremely variable, sometimes nearly evanescent. Most of the 85 specimens found were very small; the nuclear shell measures ·02 by ·016; a remarkably large specimen measures *long.* ·15, *lat.* ·17 by 15.

Hab.—Mazatlan; rare, in worm-eaten passages and burrows of Spondylus and Chama; *L'pool Col.*

Tablet 1313 contains the fry inside an adult, the nuclear shell, and 2 sp. in the first stage of normal growth.—1314, a series of 8 sp. of different ages and patterns. One has its mouth filled with most beautiful spiculæ of sponge.—1315, a sp. in situ in a fragment of Spondylus.

Family CALYPTRÆIDÆ.

The genera of this family, united by *Lesson*, *Broderip* and *Deshayes*, though very different when adult in their principal forms, are so closely related when young that if the fry be examined when just emerging from the spiral nucleus it would be difficult to say into which genus each shell would develop. The ordinary young state of Crucibulum has only half a cup, each side being laterally adherent, resembling on the one hand the sunken Crepidulæ, as C. adunca, on the other, (supposing the half-cup to grow forward separate) Calyptræa proper, (C. equestris, &c.) The amount of lateral adherence, the absence of which forms the subgenus Calyptræa *a* of Brod., (C. rudis, *Brod.*=umbrella, *Desh.*) varies in specimens of the same species. The internal lamina, more or less spread out or lobed in species of Crepidula, with the margins doubled together forming a cup in Crucibulum, is in Galerus very slightly turned over and flattened, these characters varying in the species. Trochita is simply an extreme of Galerus on the one hand, or of the spiral Crepidulæ on the other. For particulars of the generic synomyms, *v. Gray's Synopsis* in *Proc. Zool. Soc.* 1847, p. 157; *H. & A. Ad. Gen.* vol. i. p. 363; *Phil. Handb. Conch.* p. 186. For particulars of species, v. *Brod.* in *Proc. Zool. Soc.* 1834, p. 35; id. *Trans. Zool. Soc.*; *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 619; *C. B. Ad. Pan. Shells*, p. 219; *B. M. Cat. D'Orb. Moll.* p. 47. Menke's species, given in *Zeit. f. Mal.* 1846—1851, are not described with sufficient accuracy to allow of certain allocation. They seem often named from worn and young specimens, and would probably have received great revision, had the author examined a large series of specimens like the present. As he is describing Mazatlan and not New Zealand shells (as his names would sometimes imply), his species are here allotted acording to the preponderance of characters. The following genera are

adopted from their great convenience. Of Calyptræa proper, which is the best marked in its characters and is well represented both in individuals and species in the Caribbæan and equatorial West American Seas, only a single individual was found in the entire Mazatlan collection. None of the species were found with a solid shelly attachment, though a thin deposit may sometimes perhaps be traced. In general a cavity is excavated on the backs of other shells.

Family CALYPTRÆIDÆ.

Genus TROCHITA, *Schum.*

Schum. Ess. no. 11, 1815.—*Gray, Proc. Zool. Soc.* 1847, p. 158, no. 272.—*Phil. Handb. Conch.* p. 187.—*H. & A. Ad. Gen.* i. 367.

Trochus, pars, *Lam.*—Calyptræa, pars, *Desh.* Sigapatella, *Less.* 1829, *Voy. Coq.*—Trochatella, *Less.* 1830, (testo *Gray.*)—Infundibulum, *D'Orb.* 1846, non *Montf.*

This genus forms an exact transition in the shell from the spiral Crepidulæ to the Phoridæ, the animal of which is widely different. It is in fact a Crepidula, with the anterior part shortened, while the posterior is lengthened. Several species might be ranked with either genus. It is represented in the Mazatlan collection by a single specimen.

331. Trochita ventricosa, *n. s.*

T. t. ventricosâ, subdepressâ, irregulari; albidâ, castaneo imbutâ; anfractibus iii. [*? aut pluribus*] *ventricosis, maxime prope suturam ad ang.* 90° *depressam; superficie irregulariter noduloso-rugosâ, rugis subobsoletis, diagonalibus, nodulis huc et illuc prope suturam extantibus; totâ paginâ creberrime et minutissime corrugatâ; epidermide lamellosâ, corneâ, maxime prope marginem, indutâ; cavitate concavo; laminâ albâ, lineas incrementi haud monstranti, labio parum reflexo, umbilico nullo; margine formæ sedis conveniente.*

Comp. Trochita radians, (*Desh.* teste *H. & A. Ad. Gen.* i. 367,) *Dkr. Ind. Moll. Guin.* p. 36, no. 97 :=Trochus r. *Lam. An. s. Vert.* (ed. I,) vol. vii. p. 11, no. 5 :—*Schub. & Wagn. Chemn. Suppl.* pl. 229, f. 4063 :—=Calyptræa r. *Lam.* ed. *Desh.* vol. vii. p. 626, no. 8 :—=Infundibulum r. *Zool. Beech. Voy.* p. 148, pl. 39, f. 10, 11 :—=Patella trochiformis, *Chemn.*

vol. x. pl. 168, f. 1626—7 :—*Dillw. Rec. Shells*, p. 1018, no. 6 :—=Calyptræa (Trochatella) t. *B. M. Cat. D'Orb. Moll.* p. 48, no 411 :—+ Patella trochoides, *Dillw.* loc. cit. no. 7 :— +Calyptræa Araucana, *Less.* (teste *D'Orb. Cat.*)—?Jun.=Calyptræa dilatata, *Sow. Gen.* f. 9, (non Crepidula d., f. 5.)—Calyptræa radians, (max.) *Val. Voy. Ven.* pl. 14, f. 3 ; pl. 15, f. 4.

Of this beautiful species, besides the specimen here described, I have seen only one other, in the collection of T. Nuttall, Esq., from an unknown locality. It differs from the S. American T. radians, (also quoted from Benguela and St. Vincent, Guinea, on the authority of *Dr. Tams ;* and of which a remarkably conical variety is figured in Beechey's Voyage ;) and also from the Gulf species, T. spirata, in the great convexity of the whirls, which are so produced at the shoulder that the sides of the suture form nearly a right angle. It approaches most nearly to a fossil species from Dax, which however has the base still more concave. The Infundibulum Californicum, *H. Ad., (Proc. Zool. Soc.* 1851, p. 153,) which from its name might be supposed to have some connection, is a species of Polydonta, (Trochinæ.) *Diam.* ·74, *alt.* ·64, (cujus anf. ult. ·48,) *div.* 110°,

Hab.—Mazatlan ; one fresh sp. ; *L'pool Col.*

Tablet 1316 contains the specimen.

Genus GALERUS, *Gray.*

Galerus, *Humph.* 1797 :—*Gray, Proc. Zool. Soc.* 1847, p. 157, no. 269 :—*Phil. Handb. Conch.* p. 187 :—*H. & A. Ad. Gen.* vol. i. p. 367.

Trochita (pars,) *Schum.* 1817.—Calyptræa (pars,) *Lam.* 1822.—Siphopatella (pars,) *Brod.* 1834.—Infundibulum, pars, *J. Sow.*—Trochatella, pars, *D'Orb.*

Mitrula, *Gray*, 1821.—Trochilea, *Swains.* 1837.

This genus is intermediate between Crepidula or Crucibulum, and Trochita. The shell is conical, slightly spiral, with a rapidly ascending spiral lamina, doubled in upon itself. Unfortunately, no very young shells were found of this section. The plane of the vertex is parallel to the base in all observed species.

332. Galerus conicus, *Brod.*

Calyptræa (Siphopatella) conica, *Brod. Proc. Zool. Soc.* 1834, p. 38 :—*Trans. Zool. Soc.* vol. i. p. 202, pl. 27, f. 7.—*Müll.*

Syn. Noo. Test. Viv. p. 147.—(Calyptræa c.) *Lam. An. s. Vert.* vol. vii. p. 630, no. 17.— *C. B. Ad. Pan. Shells*, p. 220. no. 333.—(C. Trochatella c.) *Mke. Zeit. f. Mal.* 1851, p. 36. no. 126.—(Galerus c.) *H. & A. Ad. Gen.* i. 368.

The nuclear vertex in this species is generally eroded; but, when perfect, resembles that of G. Sinensis, about ·02 across, not prominent, with the outer whirl enveloping the rest, apex not visible. The colour is of a beautiful pinkish brown, lustrous, uniform over the shell, and variously stained or spotted. The lamina makes a rapid ascent to the margin, is much flattened, with the inner edge elegantly rounded, recurved over from 3-4ths to 4-5ths of its breadth, and a third part of its length. The recurved part is open, but not swollen within. *Long.* 1·27, *lat.* 1·17, *alt.* ·66.

Hab.—Xipixapi and Salango, attached to shells in deep water, *Cuming.*—Panama, very rare, *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1317 contains 4 sp. of which the youngest is ·08 across, and the next is coloured as in C. lichen, *Brod.*

333. GALERUS MAMILLARIS, *Brod.*

Calyptræa (Siphopatella) mamillaris, *Proc. Zool. Soc.* 1834, p. 38:—*Trans. Zool. Soc.* vol. i. p. 201, pl. 28, f. 5.—(Calyptræa m.) *Lam. An. s. Vert.* vol. vii. p. 631, no. 18.—(Galerus m.) *H. & A. Ad. Gen.* i. 368.—(Non C. Trochatella m. *B. M. Cat. D'Orb. Moll.* p. 48, no. 412.)

+ Calyptræa regularis, *C. B. Ad. Pan. Shells*, p. 224, no. 340:—id. p. 320.—(Galerus r.) *H. & A. Ad. Gen.* i. 368.

= Calyptræa (Trochatella) Lamarckii, *Mke. Zeit. f. Mal.* 1847, p. 186, no. 37:—id. 1851, p. 36, no. 125.—(Non *Desh. Lam. An. s. Vert.*, vol. vii. p. 627. no. 9.)

? + Calyptræa (Siphopatella) Lichen, *Brod. Proc. Zool. Soc.* 1834, p. 37:—*Trans. Zool. Soc.* vol. i. p. 201, pl. 28, f. 4.—(Calyptræa l.) *Lam. An. s. Vert.* vol. vii. p. 630, no. 16.—(Galerus l.) *H. & A. Ad.* i. 368.—(Teste *B. M. Cat. D'Orb. Moll.* p. 48, no. 412, = "lorica" err. typ.)

The specimens of G. mamillaris in the Cumingian collection vary greatly in colour and sculpture. Some of these, as well as G. lichen, closely resemble the young of G. conica. A microscopic examination of the nuclear vertices would probably decide the question. The vertex of G. mamillaris is

about ·02 across, generally rather separated from the shell, and of an elegant discoidal shape like Planorbis, displaying the whirls and the sunken apex. The whirls increase rapidly and regularly, sometimes developing concentric wrinkles (as in Crep. nivea,) just beyond the nuclear portion. The internal lamina makes a more complete revolution than in G. conica; the central margin is more produced, and the reflection is only over half the breadth. The Mazatlan shells differ from G. Sinensis and its W. Indian congener, in the reflection of the lip, which is nowhere closed, in the character of the nucleus, and in the non-spinous surface.* The colour is often of a rich brown within and near the vertex; otherwise of a dingy white. Epidermis very thin. The cone is more or less depressed. The form G. lichen is probably only a flattened variety of this species; but may be distinct. The C. mamillaris of D'Orb. is the C. unguis of Brod. and appears a distinct species, of which the C. sordida of Brod. is probably a variety: the lamina being so much reflexed as to pass into Crucibulum, the young of which however it does not at all resemble. The ordinary size of G. mamillaris is as in G. Sinensis; an extraordinarily large one measures *long.* 1·26, *lat.* 1·23, ·56.

Hab.—Isl. Muerte; on dead sh[illegible]andy mud, 11 fm.; *Cuming.*—(G. lichen.) Idem, *Cumi[illegible].*—(G. regularis) Panama; extremely rare; *C. B. Adams.*—Acapulco, *Col. Jewett.*—Sta. Barbara, *Col. Jewett.*—Mazatlan; not uncommon, adhering to shells, and to each other; *L'pool Col.*—Payta to Guayaquil, *D'Orbigny.*

Tablet 1318 contains 6 pale specimens.—1319, 6 do. dark colour, (one in situ.)—1320, the largest specimen.

Genus CREPIDULA, *Lam.*

Crepidula, *Lam.* 1799.—*Phil. Handb. Conch.* p. 188.
Sandalium, *Schum.* 1817.
Crypta *(Humph.* 1797) *Gray,* 1847: *H. & A. Ad. Gen.* vol. i. p. 368.

The species of this genus run into each other in the most marvelous manner. The characters even of the young shell

* The W. Indian analogue of this species is Calyptræa lævigata, *Lam.*: v. *Deless. Rec. Coq. Lam.* pl. 25, f. 3 *a, b, c.* The C. extinctorium, *Lam.* (quoted by *Sow.* for a totally different shell) appears from the same work, *loc. cit.* f. 2, *a, b,* c. to be a somewhat similar, blackish Galerus, in which however the outside and the inside representations of the spiral element do not agree.

are often by no means constant. It has been the object, in the following selection from the multitudes of individuals in the Mazatlan collection, to illustrate the variations of which each species is susceptible.*

334. CREPIDULA ACULEATA, *Gmel.*

Patella aculeata, *Gmel.* p. 3693.—*Dillw. Descr. Cat.* p. 1020, no. 11.

Patella fornicata aculeata, *Chemn. Conch. Cab.* vol. x., p. 334, pl. 168, f. 1624-5.

Patella fornicata, var. *Schreib. Conch.* vol. i. p. 338.

La Retorte épineuse, *Favanne*, vol. i. p. 564, pl. 4, f. F. 2.

Crepidula aculeata, *Lam. An. s. Vert.* vol. vii. p. 642, no. 3.—*Desh. Enc. Meth.* Vers, vol. ii. p. 27, no. 11.—*Sow. Gen.* f. 4.—*B. M. Cat. Cuba Moll.* p. 33, no. 395.—*B. M. Cat. D'Orb. Moll.* p. 48, no. 415.—?? *Brod.* in *Proc. Zool. Soc.* 1834, p. 39.—*Gould, ms. Cat. Cal. Shells.*—*Dkr. Ind. Moll. Guin.* no. 94.—*Krauss Sudafr. Moll.* p. 69, no. 4.

Crepipatella aculeata, *H. & A. Ad. Gen.* i. 369.

+ Crepidula Capensis, *B. M.*[illegible]*?* = *Quoy & Gaim. Voy. Astr.* vol. iii. p. 424, pl. 72, [illegible] 14;—*Lam. An. s. Vert.* vol. vii. p. 645, no. 9:—*Krauss, S[illegible]afr. Moll.* p. 68, no. 1.)

+ Calyptræa (Crepipatella) echinus, *Brod.* in *Proc. Zool. Soc.* 1834 p. 39.—*Trans. Zool. Soc.* vol. i. p. 203, pl. 27, f. 1.—*Müll. Syn. Nov. Test. Viv.* p. 148.—*H. & A. Ad. Gen.* i. p. 369.—(Crepidula e.) *Lam. An. s. Vert.* vol. vii. p. 650, no. 23.—*C. B. Ad. Pan. Shells*, p. 226, no. 344.

+ Calyptræa (Crepipatella) hystrix, *Brod. Proc. Zool. Soc.* 1834, p. 39:—*Trans. Zool. Soc.* vol. i. p. 203, pl. 29, f. 2.—*H. & A. Ad. Gen.* i. p. 369.—(Crepidula h.) *Lam. An. s. Vert.* vol. vii. p. 650, no. 22.

+ Crepidula costata, *Mke.* in *Zeit. f. Mal.* 1847, p. 183, no. 32: (non *Sow.* nec *Quoy*, nec *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 644, no. 7.)—Id. 1851, p. 35, no. 122.

+ Crepidula Californica, *Nutt.* ms. in Warrington Mus.

* I have been compelled to unite several species usually regarded as very distinct. On shewing a series to an author deservedly distinguished, proving that four species were identical which he had grouped under two subgenera, he complained that I had kept all the puzzling shells! It is easy, as one naturalist is recorded to have done, to smash all specimens not according with our classification; or as another, to pick out all the leading forms and describe them as distinct species, genera, or even orders, disregarding the intermediate ones which would have proved them identical; but the interests of science are not served by either one course or the other. Our object must ever be, not to make Nature speak our language, but to find out what is the language of Nature.

My attempts to find specific differences between the Atlantic and Pacific shells have entirely failed. The former are generally of a more reddish, the latter of a browner cast; but those from Chili belong to the Atlantic type; while those from Honduras go through the same changes as the Mazatlan shells. The Patagonian shells may belong to either type. The C. echinus of Brod. represents the form in which all the ribs are equal and very spiny; the C. hystrix that in which a few are developed, with large spines, at the expense of the rest. The two forms run into one another, and into the common form almost imperceptibly. In first describing them, *Brod.* candidly states that he would not be positive that they are not all varieties of C. aculeata. There is a distinct variety which bears the same relation to the typical form that C. squama does to C. nivea. It is flat, very regular, without spines, but covered with extremely crowded imbricated scales. The Californian variety is the most aberrant, being small, nearly round, and never spiny. It might pass for a distinct species, were it not that a few of Mr. Nuttall's specimens exactly belong to the Mazatlan type, while some few of the degenerated Mazatlan specimens are closely allied to those from Monterey.—The young shells which Menke obtained from coral on Spondylus, Chama, and Murex nigritus, and affiliated to the New Zealand form, (so well marked that it received the same name from three distinct sources), appears from the diagnosis to belong to this species.

C. aculeata belongs to the group of regularly spiral Crepidulæ. It begins life as a smooth, glossy, light horn-coloured, Velutina-shaped shell, with rapidly increasing whirls, and a sunken apex. This is much larger than the nuclear part of C. nivea, though the adult shell is much smaller; being about ·025 across when it begins its second stage. C. nivea begins with concentric ridges and goes on smooth, rapidly increasing, but in a regular curve. C. aculeata makes a sudden expansion when forming its deck, and then develops ridges as in the form C. Lessonii. These soon become more or less undulated, and then assume the state of vaulted spines, differing in size and arrangement, and in the period at which they commence. At the same time various rays or spots of chesnut colour appear. Within, the growth of this species offers a well marked contrast to that of C. nivea and its congeners. Instead of forming a basal columella lip and then throwing up a deck at a considerable angle, this shell makes the columella lip the

commencement of its deck, which it continues from it in a regular curve. The marginal lip also is very short, not covering the spire as in C. nivea, &c., but leaving it for a long time very conspicuous. The shell in its early decked stage has much the appearance of a Neritina. The deck however is extremely thin, always displaying striæ of growth. It soon develops a central sinus, leaving the margin arcuated, not angulated. From this regular spiral growth, the transition is easy, through other species, to the form Trochita. The adult shell has normally a deck margin of the form ∼, one side of the brace being longer than the other. The point develops a spiral line to the apex. Sometimes however this point is rounded; each sinus and lobe may be developed at the expense of the rest; and in one specimen, the outer lobe being pointed while the middle point is rounded, the margin assumes the form of an irregular inverted brace ∽. The ordinary colour is a yellowish white variously striped, spotted or mottled with lustrous chesnut or dark brown. Rarely the whole shell is dark brown, most rarely pure white. The red tints observable in the Chili and Atlantic specimens have not been found in the Gulf district: they are not mentioned however in Dillwyn's description, and perhaps are due to the fading of the brown, most of the W. Indian specimens in collections being dead. Those brought by Mr. D. Dyson from Honduras are coloured like the Mazatlan specimens. The external markings, on which Brod.'s species are founded, are extremely variable. Well developed specimens of hystrix and echinus are rare; but intermediate forms between these and the common state with irregular crowded small vaulted spines, are abundant. The W. Indian specimens moreover go through the same changes of sculpture. The delicately grown shells, which are flatter and broader in proportion, are rough to the touch, but the spines are scarcely discernible without a glass. On coarsely grown shells, they are often not developed over part of the surface. The amount of spiral involution varies considerably in different specimens. (Comp. C. Calyptræiformis, *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 647, no. 15.) The smallest specimen is ·03 in length.

The largest sp. measures	*long.*	1·73,	*lat.*	1·06,	*alt.*	·41.
A convex sp.	,,	,,	1·12,	,,	·87,	,,	·46.
A flat sp.	,,	,,	1·1,	,,	1·,	,,	·26.
An elongated sp.	,,	·8,	,,	·41,	,,	·19.
A convolute sp., *apex to front*		·68,	*to back*	·33.		
A straight sp.	,,	·92,	,,	·18.		

A long decked sp., *margin to front* ·36, *to back* ·47.
A short do. ,, ·48, ,, ·3.

Hab.—(C. aculeata) W. Indies, passim, *auct.*—Cuba, *Sagra.*—Honduras, *Dyson.*—Brazils: Patagonia; *D'Orbigny.*—Benguela; 1 sp. in excellent preservation; *Tams.*—Table Bay, *Krauss.*—Cape Natal, Mus. Cuming.—Isle of France, *Favanne.*—Kurachee, Mouth of the Indus, Mus. Cuming.—Port Jackson, *Rev. R. L. King.*—New Zealand, *Rev. R. Taylor.*—Sydney and Swan River, Mus. Cuming.—(Dark var.) Japan, Mus. Cuming.—(Light var.) Chili, *Capt. Ld. Byron.*—(C. echinus, &c.) Lobos Is. Peru, *Cuming.*—Panama; under stones at low water, rare; *C. B. Adams.*—(C. Californica) Monterey, common, *Nuttall.*—Mazatlan; common, on shells &c.; young shells abundant on Chamæ and Spondyli; *L'pool Col.*

Tablet 1321 contains 10 sp. extremely young.—1322, 7 do. a stage older, with a fragment to shew the inner surface of the deck.—1323, a young deformed shell, nearly smooth, probably belonging to this species.

Specimens illustrating form and sculpture.—Tablet 1324 contains 8 sp. (*var.* hystrix) of different ages.—1325, 13 sp. do. (*var.* echinus.)—1326, 8 sp. do. finely aculeate, arched.—1327, 10 sp. do. flat, (one of the young in situ on an adult.)—1328, 8 sp. do. spiny processes imperfectly developed.—1329, 4 sp. do. (*var.* Californica.)—1330, a series of 12 sp. shewing gradations between the above forms.—1331, 7 sp. shewing gradations from flat to arched.—1332, 6 sp. shewing gradations in amount of spiral involution.—1333, 5 sp. shewing gradations in size of deck.—1334, 6 sp. shewing gradations in prominence or sinking of deck.

Specimens shewing shape of deck.—Tablet 1335 contains 3 sp. center pointed, sides much swollen.—1336, 4 do. sides swollen.—1337, 3 do. sides slightly swollen.—1338, 3 do. center rounded.—1339, 1 do. point turned outwards.—1340, 4 do. form approaching C. nivea.—1341, 3 do. deck partially opaque.

Specimens displaying changes of colour.—Tablet 1342 contains 2 sp. (hystrix and echinus) pure white.—1343, 10 sp. variously shading into brown.—1344, 11 sp. do. dark lustrous brown.—1345, 12 sp. tortoiseshell, variously mottled.—1346, 5 do. whiter tint.—1347, 6 do. more or less tinged with green.

Distorted specimens.—Tablet 1348 contains 7 sp. of irregular shape.—1349, 7 sp. diseased by worms.—1350, 3 sp. with additional margin.—1351, 4 sp. passing towards C. nivea.—1352, 3 sp. passing towards C. onyx.

335. CREPIDULA DILATATA, *Lam.*

An. s. Vert. vol. vii. p. 644, no. 5.—*Deles. Rec. Coq. Lam.* pl. 25, f. 4, *a*, *b*, *c*.—*Sow. Gen.*, f. 5, *jun.*—*B. M. Cat. D'Orb. Moll.* p. 49, no. 418.—Var. *Brod. Proc. Zool. Soc.* 1834, p. 38:—*Trans. Zool. Soc.* vol. i. p. 203, no. 21, pl. 28, f. 11.—(Crepipatella d.) *H. & A. Ad. Gen.* i. 369.

+ Crepidula depressa, *Desh. Enc. Méth.* Vers, vol ii. p. 26, no. 5. (? teste *Desh.*)

+ Crepidula Peruviana, *Lam. An. s. Vert.* vol. vii. p. 49, no. 6.—*Deles. Rec. Coq. Lam.* pl. 25, f. 5, *a*, *b*, *c*.—*Dkr. Ind. Moll. Guin.* p. 35, no. 95.—(Crypta P.) *H. & A. Ad. Gen.* i. 369.

+ Crepidula patula, *Desh. Enc. Méth.* Vers, vol. ii. p. 27, no. 9.—*Lam. An. s. Vert.* vol. vii. p. 646, no. 13.—(Crypta p.) *H. & A. Ad. Gen.* i. 369.

= Crepidula Adolphei, *Less. Voy. Coq. Zool.* vol. ii. pl. 15, f. 2, 2A. anim. revers.—(Crepipatella A.) *H. & A. Ad. Gen.* i. 369.

+ Crepidula Nautiloides, *Less.* (teste *D'Orb. Cat.*)

+ Calyptræa (Crepipatella) strigata, *Brod. Proc. Zool. Soc.* 1834, p. 39:—*Trans. Zool. Soc.* vol. i. p. 203, pl. 28, f. 12. *Zool. Beech. Voy.* p. 148, pl. 39, f. 13.—(Crepidula s.) *Lam. An. s. Vert.* vol. vii. p. 651, no. 24.—Crepipatella s.) *H. & A. Ad. Gen.* i. 369. (teste *D'Orb. Cat.*: ?? teste *Brod.* ipse.)

?? + Calyptræa (Crepipatella) pallida, *Brod. Proc. Zool. Soc.* 1834, p. 39:—*Trans. Zool. Soc.* vol. i. p. 204, pl. 29, f. 3.—(Crepidula p.) *Lam. An. s. Vert.* vol. vii. p. 650, no. 21.—Crepipatella p. *H. & A. Ad. Gen.* i. 269. (teste *D'Orb. Cat.*)

+ Crepidula arcuata, *D'Orb.* [quasi *Brod.*] *B. M. Cat. Moll.* p. 49, no. 420. (teste *Gray.*)

? + Calyptræa (Crepipatella) foliacea, *Brod.* loc. cit. pl. 28, f. 9.—*B. M. Cat. D'Orb. Moll.* p. 49, no. 419. (? teste *Gray.*)

? + Crepidula Patagonica, *D'Orb. B. M. Cat.* p. 48, no. 416, (? teste *Gray.*)

Comp. Crepidula lineolata, *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 646, no. 11.

To this formidable list of synonyms, Dr. Gray adds C. protea of *D'Orb.* and D'Orbigny adds C. unguiformis, *Brod.* These shells appear however more nearly related to C. nivea, *C. B. Ad.* and C. unguiformis, *Lam.*, to which last, the West Indian specimens of C. protea (*B. M. Cat. Cub. Moll.* p. 33, no. 396) probably belong. Some of the specimens marked C. protea by *D'Orb.* are perhaps dead shells of C. onyx. It will be observed that this species is distributed under two subgenera

by Messrs. Adams. No specific difference can be traced between the Sandwich Island specimens, those from Mauritius, and the abundant forms from S. America. The species does not affect the Northern hemisphere. It is not quoted by C. B. Adams in his Panama list. The solitary specimens from Guinea, Mazatlan and California may have been imported. Of the two Lamarckian names, the first is chosen, although very imperfectly described from a single specimen in the collection of Mde. de Bandeville, because it well expresses the usual character of the species, and has been adopted by D'Orbigny. *Long.* 1·42, *lat.* 1·2, *alt.* ·68..

Hab.—S. America, *D'Orbigny.*—Mazatlan; 2 large but dead specimens; *L'pool Col.*—Lower California; 1 dead specimen; *Major Rich.*—(C. Peruviana.) Peru, *Dombey.*—Peru and Chiloe, *Bern. Philippi.*—(1 sp.) Loander, *Tams.*—(C. patula) Otaheiti, *Lesson.*—(C. strigata.) Valparaiso; on Mytili, 3—6 fm.; *Cuming.*—(C. pallida.) Falkland Is.; under stones; *Cuming.*—(C. arcuata.) Payta, Peru, *D'Orbigny.*—(C. lineolata.) South Seas, Deshayes.

Tablet 1353 contains a specimen, with attachments of two others on its back.

336. CREPIDULA ?DORSATA, *Brod., var.* BILOBATA.

C. t. tenui, subcirculari, subdiaphanâ, albidâ, sæpe fusco radiatâ seu maculatâ; vertice nucleoso globoso, satis magno, apice subdepresso, anfractibus rapide augentibus, vix extante, haud prominente, à margine valde remoto; lævi, seu striis incrementi, interdum lamellis irregularibus; huc et illuc vix radiatim striatâ, seu propter sedem quasi costatâ; laminâ tenui, bilobatâ, lobâ posteriori parvâ, anteriori maximâ, ad extremitates sinuatâ, apicem versus impressâ, incrementi lineas monstrante.

Calyptræa dorsata, *Brod. Proc. Zool. Soc.* 1834, p. 38:—*Trans. Zool. Soc.* vol. i. p. 202, no. 20, pl. 28, f. 10.

About a dozen young specimens of this species were found in the shell washings; but some beautiful ?adult shells are in Mr. Cuming's Col. The form is intermediate between Crepidula and Crucibulum, the young state of which it greatly resembles. The lamina is attached by less than one half of its total length; and the vertex is situated about half way up the height of the shell. The above diagnosis was written in ignorance of Broderip's species, which (with others) had been lost

in Mr. Cuming's Museum, but which he has allowed me to restore from the overwrought figures in the Transactions. It is closely related to some forms of C. dilatata, jun.

The mode of growth in the young shell is as in C. nivea, &c. The vertex is rather large, ·02 in. or upwards across, Velutina-shaped, smooth, with a rather sunken apex and rapidly increasing whirls. On commencing the permanent form, it spreads a film over the base of the spire and a very large margin all round. The deck commences at a considerable angle from this film, first as a marginal line, then gradually developing till the lobes are formed. The vertex is rather prominent, but not separate from the body of the shell. Some of the shells are more solid than Mr. Cuming's adult specimens; and further agree with the typical C. dorsata in being of a yellowish cast, with the deck rather brown. The subdiaphanous white specimens are sometimes spotted with chesnut. The largest Mazatlan specimen, (the margin of which is dentated) measures . . *long.* ·33, *lat.* ·37, *alt.* ·12.

Mr. Cuming's sp. . „ ·6, „ ·56, „ ·27.

Hab.—(C. dorsata.) St. Elena; on dead shells, in sandy mud, 6 fm.; *Cuming*, (teste Brod.:—Valparaiso, teste Mus. Cum.)—*(Var.* bilobata.) California; Mus. Cuming.—Mazatlan; extremely rare, jun., on shells; *L'pool Col.*

Tablet 1354 contains 5 sp. of different ages. In the first, ·03 across, the margin is formed, but not the deck: in the second, the deck line has commenced.

337. Crepidula excavata, *Brod.*

C. t. tenuiore, lævi, oblongâ, latere dextro expanso, sinistro convexo; albâ, castaneo varie maculatâ, intus nitente; vertice valde adunco, à margine maxime separato, dextrorsum valde spiraliter contorto; nucleo satis magno, discoidali, satis inflato, apicem depressum monstrante, regulariter crescente; habitu incrementi subspirali, obliquo, regulari; septo tenuiori, vix opaco, ad marginem lineas incrementi monstrante, vix in medio; haud aliter sinuato; oblique et profunde sito, cavitate magnâ ad verticem ascendente; limbo acuto.

Calyptræa (Crepidula) c. *Brod.* in *Proc. Zool. Soc.* 1834, p. 46:—*Trans. Zool. Soc.* vol. i. p. 205, no. 29, pl. 29, f. 7.—*Müll. Syn. Nov. Test. Viv.* p. 150.

Crepidula c. *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 649, no. 19.—*C. B. Ad. Pan. Shells*, p. 226, no. 345.

This beautiful and rare species combines the form and habit of growth of the Atlantic C. porcellana, *Linn.* with the very remote apex of C. aduncа. This character also separates it from C. arenata, *Brod.* (found at S. W. Mexico, *P. P. C.*, but not at Mazatlan,) to some forms of which it bears a close resemblance. C. arenata occasionally develops an apical hole within, (Mus. Cum.): but is never seen with the very oblique growth of this species. The nucleus is like a regular, somewhat tumid Planorbis; shewing the whirls within, and measuring about ·02 in. across. The enlargement is regular, and the young shell has exactly the characters of the adult, except that the apex, though separate, is nearer the margin. Only two very young specimens and one adolescent were found in the Mazatlan collection; a larger one, probably from the same collection, was obtained from a shop: and some very fine ones are in the Cumingian Museum. The smallest specimen is ·12 in length; the largest *long.* ·95, *lat.* ·64, *alt.* ·35.

Hab.—Real Llejos, *Cuming*, teste Broderip: (but Gulf of California, teste Mus. Cum.)—Panama, 1 sp. *C. B. Adams.*—Mazatlan; extremely rare, jun. on Spondylus; *L'pool Col.* Tablet 1355 contains a young sp.—1356, an adolescent sp.

338. CREPIDULA ADUNCA, *Sow.*

Tank. Cat. no. 823, *App.* p. vii.—(Crypta a.) *H. & A. Ad. Gen.* i. 369.
= Crepidula solida, *Hinds, Voy. Sulph. Moll.* p. 53, no. 218, pl. 16, f. 7, 8.—(Crypta s.) *H. & A. Ad. Gen.* i. 369.
= Crepidula rostriformis, *Gould, Exp. Shells*, 1846, p. 14.
Jun. = Crepidula rostrata, *C. B. Ad. Pan. Shells*, pp. 235, 320, no. 353.—(Crypta r.) *H. & A. Ad. Gen.* i. 369.
Jun. var. = Crepidula uncata, *Mke.* in *Zeit. f. Mal.* 1847, p. 184, no. 34.
= Crepidula incurva, var. *P. P. C. Cat. Prov.*
Garnotia solida, *Gray, Gen. Moll. B. M.* p. 117.

The very remarkable form of this species has attracted the attention of six celebrated naturalists, each of whom have imposed upon it a separate name. The first three specific names are identified from the types; the other two from the very accurate descriptions given. The irregular corrugations of *C. B. Ad.* are abnormal, as are also the three ridges of *Menke.* Normally, the shell is quite smooth, with a rather glossy epidermis; with

the colour lighter than in C. incurva, and disposed to break up into spots; shaped like Emarginula rosea, with a very recurved, distant and projecting vertex, a short, deeply sunk and slanting deck, and a hole above it passing up the spire. The characters are like some of the forms of Cr. incurva intensified; and are subject to considerable variation. The mode of growth is as in that species; but the planorbiform vertical whirls are even smaller, (about ·01 across) with the apex deeply sunken. The smallest specimen is ·15 in length; the largest found measures *long.* ·84, *lat.* ·62, *alt.* ·46.
A flat sp. „ ·62, „ ·48, „ ·18.
The shortest-decked specimen measures ·16 from deck margin to the posterior, ·39 to the anterior end, with an apical projection of ·14.

Hab.—Bodegas, California; attached to dead and living shells and to each other, 6-10 fm.; *Hinds.*—Straits of De Fuca, *Gould.*—Sta Barbara, *Col. Jewett.*—Panama, extremely rare, *C. B. Ad.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1357 contains 2 sp. very young. 1358, 1 sp. flat, margin extended.—1359, 1 sp. compressed, dark brown.—1360, the largest sp., twisted growth, slightly ribbed and corrugated.—1361, 1 sp. pale flesh colour.

339. CREPIDULA INCURVA, *Brod.*

Calyptræa (Crepidula) incurva, *Brod. Proc. Zool. Soc.* 1834, p. 40:—*Trans. Zool. Soc.* vol. i. pl. 29, f. 6—*Müll. Syn. Nov. Test. Viv.* p. 150.
Crepidula incurva, *B. M. Cat. D'Orb. Moll.* p. 49, no. 421.—*C. B. Ad. Pan. Shells*, p. 228, no. 347.—(Crypta i.) *H. & A. Ad. Gen.* i. 369.
=Crepidula hepatica, *Menke*, (non *Desh.* nec *C. B. Ad.* nec *Krauss,*) *Zeit. f. Mal.* 1847, p. 184, no. 33.

This species is known normally by the sharp longitudinal ridges on the back, which are not dependent on the attachment, being regular in growth, and conspicuous when adherent on smooth shells. It is much smaller than C. onyx, of a deeper chocolate brown colour, convex, with the beak very prominent, smooth and black as in C. rugosa, *Nutt.* The epidermis is rather thin and deciduous. There are however so many specimens in which one or other of these characters pass away, that

it is not impossible that further researches may prove their identity.

The vertex of C. incurva is discoidal and smooth, as in C. onyx, rather smaller, and more hidden by the subsequent growth of the shell. The earlier portion is very convex, smooth, nearly black. It develops ridges rather suddenly, strong enough to serrate the margin, which is then beautifully variegated with horn colour and tortoiseshell, and frequently rather spreading. As the shell advances, the ribs often pass away, leaving traces however by which the species may generally be recognized. The deck occupies a larger or smaller proportion in different specimens, and is more or less sunken, rarely developing a slight hole under the vertex, approaching C. adunca. The spreading specimens generally assume a lighter colour, like C. onyx, which in mode of growth and in the character of the deck they closely resemble. A large proportion of the shells are truncated in front, as though from living against a rising surface. The youngest specimen is ·07 in length; a large one, approaching C. onyx, and living like an operculum in the mouth of Uvanilla unguis, measures

	long.	·9,	*lat.* ·6,	*alt.*	·25.
A convex, spreading sp.	,,	·92,	,, ·67,	,,	·4.
A narrow sp.	,,	·82,	,, ·46,	,,	·33.

Hab.—St. Elena and Xipixapi; on dead shells in sandy mud 6—10 fm.; *Cuming.*—Payta, *Fontaine.*—Panama; on living Gasteropods at and near low water mark, and on each other, common; *C. B. Adams.*—San Blas, *Capt. Wendt,* (Menke.)—Mazatlan; on shells and on each other, not uncommon; *L'pool Col.*

Characters approaching C. onyx. Tablet 1362 contains the specimen in U. unguis.—1363, 1 sp. nearly smooth, singularly indented.—1364, 3 sp. scarcely striated, flat.—1365, 3 do. convex, laterally compressed.—1366, 3 sp. slightly striated, flattened, light coloured.—1367, 3 do. very dark.—1368, 3 do. more striated, light colour.

Normal state. Tablet 1369 contains 3 sp. very young.—1370, 6 sp. different ages, deck margin deeply angulated.—1371, 4 sp. slightly do.—1372, 4 sp. slightly sinuated.—1373, 4 sp. flattened, broad.—1374, 7 do. lighter colour, deck margin nearly straight, direction slanting.—1375, 6 sp. deep, compressed growth.—1376, 4 sp. twisted, vertex at the left.—1377, 3 do. vertex at the right.—1378, Columbella fusca, with Crepidula incurva, shewing attachment.—1379, Pisania hæmastoma, with

2 Cr. incurva in situ, one on the other.—1380, 2 sp. with Bryozoa and Serpula.

Aberrant specimens. Tablet 1381 contains 2 sp. deck thin, as in C. nivea.—1382, 1 sp. very convex, light coloured.—1383, 2 sp. deck variable in length.—1384, 5 sp. margin irregular.—1385, 4 do. diseased.—1386, 3. sp. form approaching C. aduncа, jun.—1387, 5 do. adult.

340. CREPIDULA ONYX, *Sow.*

C. t. solidiore, plerumque lamellis, ad marginem sæpe, extus rare apparentibus, instructâ; epidermide olivaceâ copiose indutâ, irregulariter lamellosâ, haud nitente; habitu incrementi plerumque recto, seu incurvato, haud spirali; planatâ, seu interdum convexâ; colore hepatico, splendente, interdum nigriore, rarè livido-carneo; vertice nucleoso parvo, lævi, discoidali, apice celato, prope marginem plerumque centraliter sito, sæpissime ad marginem vecto et detrito; testâ juniore subcorneâ, castaneo maculatâ, haud nigrâ; septo interno solidiore, opaco, albo, striulas incrementi nisi marginem versus haud monstrante, margine plus minusve intus angulato, nec antice nec postice distincte sinuato.

Sow. Gen. Crepidula, f. 2.

Crypta onyx, *H. & A. Ad. Gen.* i. p. 369.

=Crepidula ? hepatica, *C. B. Ad. Pan. Shells*, p. 227, no. 346. (teste sp. typ. in Mus. Cum.): non *Menke* in *Zeit. f. Mal.* 1847, p. 184, no. 33.

?=Crepidula hepatica, *Desh. Enc. Méth.* Vers, 1830, vol. ii. p. 26, no. 7:—*Lam. An. s. Vert.* vol. vii. p. 646, no. 12.—(Crepipatella h.) *H. & A. Ad. Gen.* i. 369.

?=Crepidula hepatica, *Krauss Sudafr. Moll.* p. 69, no. 3, pl. 4, f. 12 *a, b.*—*Dkr. Ind. Moll. Guin.* p. 34, no. 92, pl. 5, f. 4, 5.

=Calyptræa amygdalus, *Val. Voy. Ven.* pl. 15, f. 3.

Var. ?=Crepidula contorta, *Mke. Zeit. f. Mal.* 1851, p. 35, no. 121, (non *Quoy & Gaim.*)

Jun.=Crepidula Cerithicola, *C. B. Ad. Pan. Shells*, pp. 225, 320, no. 343.

Comp. Crepidula rugosa, *Nutt.* in *Jay's Cat.* p. 107, no. 3043, *bis.*—*Proc. Zool. Soc.* 1856.—(Crypta. r.) *H. & A. Ad. Gen.* i. 369.

Whether Deshayes described his C. hepatica from a Pacific or African shell is not known; and whether the two are identical has not yet been ascertained, the African specimens being generally too much worn for comparison. Krauss' var. com-

planata appears exactly to correspond with the Pacific shell, to which it is referred with certainty by *Dkr.*, with unwilling doubt by *C. B. Ad.* The shell quoted by him from *Mke.* appears (with hardly a doubt) to be C. incurva. The C. rugosa, *Nutt.* referred to this species by Jay, agrees in almost all respects; but differs in the epidermis which though somewhat lamellar is glossy, never shaggy; and in the young shell which is of a very dark colour, with a Velutina-shaped vertex. These most closely related species are however referred to different subgenera by Messrs. Adams.

C. onyx begins life like a swollen Planorbis, about ·013 across, with the apex more or less concealed. It increases as in C. nivea, leaving the vertex free, submarginal, and generally medial, the shell increasing in the plane of the vertex, so that the latter can only be seen when the shell is set on its side. At this period the body of the shell is light horn-coloured, with copious stains of tortoiseshell. As it increases, it develops the lamellose structure and shaggy epidermis of C. nivea, so that the light-tinted specimens of this can with difficulty be separated from the dark specimens of the other, the characteristic verticcs being generally lost in the onward progress of the shell. The character of the deck, similar in the young shell, is strikingly different in the adult; for while it develops the central angle, more or less, the extremities are not sinuated; and the substance does not display striæ of growth, except close to the margin, the principal part being opaque and uniform. In this it closely resembles C. incurva, from some varieties of which it can scarcely be distinguished. The outer surface very rarely develops faint longitudinal undulations, (never sharp ridges as in C. incurva) probably from adhering to ribbed shells. Even in specimens with the epidermis very fresh, it is often rubbed smooth at different angles on the back, ?from adhering to pebbles rolled by the tide. The inside is richly lustrous, generally brilliantly hepatic, rarely blackish brown, most rarely of a light flesh colour. The smallest (imperfect) specimen is ·07 long; a flat sp. (convex when young) measures *long.* 1·04, *lat.* ·7, *alt.* ·1;
A twisted sp. „ 1·36, „ ·9, „ ·6.
The largest sp. „ 2·2, „ 1·3, „ ·6.
This shell weighs ·66 oz., and displays a thickness of laminæ amounting at the umbo to ·43 in.

Hab.—Panama; on Strombus Peruvianus and other shells, rare; *C. B. Adams,*—Mazatlan; very rare, on shells, &c.

L'pool Col.— [C. ? hepatica : Benguela and Loander, very common and variable, *Tams*: Tafel Bay and Natal, *Krauss.*]

Tablet 1388 contains 3 sp. very young.—1389, 4 sp. different ages, finely grown.—1390, 2 sp. form approaching C. incurva; one very dark.—1391, 1 sp. with irregular ridges, passing to the form Lessonii.—1392, 1 sp. twisted, apex lateral.—1393, the largest specimen.—1394, 1 sp. light coloured, slightly rayed with darker.—1395, 1 sp. very light coloured, beginning convex, suddenly becoming flat and slightly rayed in the middle.

Tablet 1396 contains 2 young sp. var. Lessonii, probably belonging to this species, but perhaps to C. nivea.

341. Crepidula nivea, *C. B. Ad.*

Cr. t. ellipticâ, subrotundatâ, seu maxime elongatâ; tenui, seu incrassatâ; intus niveâ, lineis castaneis radiantibus sæpo ornatâ; sublævi, seu irregulariter concentrice plus minusve rugosâ, seu lamellis extantibus varie instructâ; limbo acuto, seu maxime planato, lamelloso; epidermide copiosâ irregulariter lamellosâ; superficie seu striulis concentricis seu (sub lente) rugulis radiantibus vario cælatâ; habitu incrementi vix spirali; vertice nucleoso minimo, Velutinæ simili, apicem monstrante, castaneo, rare albo, rugis concentricis conspicuis instructo, satis prominente, spiraliter subito augente, dextrorsum deflecto, à margine vix remoto, sæpe ad marginem vecto et detrito; septo plus minusve in medio angulato seu sinuato, ad sinistram partem plus minusve profundè, ad dextram parum sinuato, tenui, lineas incrementi, haud lineam centralem monstrante.

C. B. Ad. Pan. Shells, 1852, pp. 234, 320, no. 351: diagn. auct.—(Crypta n.) *H. & A. Ad. Gen.* i. 369.

+ Calyptræa (Crepidula) Squama, *Brod. Proc. Zool. Soc.* 1834, p. 40:—*Trans. Zool. Soc.* vol. i. p. 205, pl. 29, f. 10.—*Müll. Syn. Nov. Test. Viv.* p. 151.—(Crepidula s.) *Lam. An. s. Vert.* vol. vii. p. 648, no. 16.—*C. B. Ad. Pan. Shells*, no. 649, p. 229.—(Ianacus s.) *H. & A. Ad. Gen.* i. 370.—? = Crepidula Goreensis, *Mke. Zeit. f. Mal.* 1851, p. 36, no. 124.

+ Crepidula striolata, *Mke. Zeit. f. Mal.* 1851, p. 35, no. 123.

+ Calyptræa (Crepidula) Lessonii, *Brod. Proc. Zool. Soc.* 1834, p. 39:—*Trans. Zool. Soc.* vol. i. p. 204, pl. 29, f. 5.—*Müll. Syn. Nov. Test. Viv.* p. 149.—(Crepidula L.) *Lam. An. s. Vert.* vol. vii. p. 649, no. 20.—(Ianacus L.) *H. & A. Ad. Gen.* i. p. 370.

=Crepidula unguiculus, var. *Brod.* in *Mus. Cum.*—[Ianacus unguiculus, *Sow.* ?ubi) *H. & A. Ad. Gen.* i. 370.

?=Crepidula Patagonica + C. protea, *D'Orb.* (pars,) *B. M. Cat. Moll.* p. 48, no. 416, 417.

Comp. Crepidula Navicelloides, *Nutt.* in *Jay's Cat.* p. 107, no. 3035, (Upper California.)

Comp. Crepidula explanata, *Gould, Cal. & Mex. Shells*, p. 4, pl. 14, f. 7.=Calyptræa perforans, *Val. Voy. Ven.* 1846, pl. 24, f. 9, 9 *a*, *b*. [The author seems to imply that the creature burrows: the specimen represented however has evidently been developed in the hole of a Lithophagus.]=C. exuviata, *Nutt.* in *Jay's Cat.* p. 107, no. 3027.

This creature, when flat and finely grown, is the C. squama of *Brod.* The same shell, when coarsely grown, more convex and without brown stripes, is the C. nivea of *C. B. Ad.* When the layers of which C. nivea is composed, instead of lying regularly one over the other, are slightly prominent, it becomes the C. striolata, *Mke.* When they are drawn forwards and project, it becomes the C. Lessonii, *Brod.* The name of Prof. Adams is retained, in preference to the prior ones of Broderip and Menke, as representing the normal condition of the shell. The name C. unguiculus has priority, but does not appear to have been published. Among the specimens marked C. protea and C. Patagonica by *D'Orb.* in his collections, there are several which seem to belong to this species; others to C. onyx, &c. *v.* supra. Both are referred by Dr. Gray to C. dilatata, (*B. M. Cat. D'Orb. Moll.* p. 49.)

C. nivea begins life as a minute Velutina-shaped body, with a sunken apex and coarse concentric folds. When this has grown to about ·015 across, it suddenly enlarges itself, throws a columellar lip over the base of the shell, raises a more or less prominent margin round it, so as to surround the vertex, and commences its septum at an angle from the columellar lip varying from about 90° at the posterior to 130° at the anterior end. The smallest shell found measures ·015 in length, on which these stages are distinctly traceable. The septum is at first straight, then angulated in the middle, lastly with an anterior sinus.

In the 'squama' stage, it appears as a very thin flat shell; with the vertex generally lustrous brown, sometimes white; from this radiate a greater or less number of brown lines, sometimes more or less broken into dots, gradually losing

themselves in the white texture of the shell, sometimes reappearing at the margin, sometimes altogether absent. Very rarely a rich lustrous brown is developed inside, as in C. onyx, shading into a sea-weed green. The shell is covered with a copious yellowish-green epidermis, which lies in a fringe round the sharp margin. Under this, the surface presents concentric striæ of growth, and very fine longitudinal corrugations. Either of these however may disappear, or be developed at the expense of the other. The vertex is either in the margin, or as much as '08 removed from it; it is not imbedded in the surface of the shell as in C. unguiformis, but is slightly prominent, displaying its rugose folds. Both these and the vertex itself are often rubbed off.

In its ordinary state, the texture has a tendency to run into layers. The epidermis does the same, the layers being in shreds and very copious. These layers in the adult are often continued to the margin, making it broad and flat. At other times they stand out more or less on the back of the shell. Sometimes the shell advances longitudinally, making layers at more or less regular intervals, becoming then the aberrant form C. Lessonii; which is however connected by such gradual links, through C. striolata, with the typical C. nivea, as not to admit of separation. In this form, (common in some places, but extremely rare at Mazatlan, the vertex is generally left behind and rubbed off: in the only S. American specimen in which it was found, it exactly agreed with the remarkable character of C. nivea. The specimens in Mus. Cuming from Vancouver's Str. (without authority,) are large and spreading; with the apex small and ribbed as in C. nivea, but white.

Of the shells collected by Mr. Nuttall at Monterey &c., some want the vertex, but otherwise resemble C. nivea: one very young specimen however has a specifically different vertex, more resembling Cr. fornicata, &c. The C. explanata of Gould is probably a variety of the Monterey shell, caused by living in the hole of a Lithophagus; similar forms of C. nivea being found among the Mazatlan shells. It differs in the cancellated structure between the laminæ, which however is not seen in the Cumingian specimens. In its young state, the shape is normal. If the species should prove distinct, the name of *Gould* must take the place of the prior names of *Nutt.* and *Val.*, the former not having been described, and the latter representing an untruth.

The growth of C. nivea is rather straight, after the nuclear portion is completed, with the vertex submedial or directed

to the right: sometimes however it is rather spiral, resembling C. aculeata. The deck margin generally has a more or less re-entrant angle in the middle. This however is sometimes rounded; sometimes nearly straight. The sides are either straight or lobed. The anterior sinus is either very deep or scarcely perceptible. The sinuated part is sometimes callous. The surface of the deck is generally thin, displaying fine striæ of growth. The inner surface is either very glossy, or (under the microscope) most finely corrugated. The coloured lines are extremely variable in the same specimen, being often conspicuous when young and suddenly ending. Very young shells were extremely rare. The animal hollows out a place for itself on Patella Mexicana, &c.; but no shelly deposit has been observed. The largest sp. measures *long.* 1·95, *lat.* 1·35, *alt.* ·46.

A flat sp.	„	„	1·46,	„	1·02,	„ ·14.
A rounded, convex sp.	„	„	·77,	„	·68,	„ ·26.
An elongated sp.	„	„	1·35,	„	·6,	„ ·3.
Sp. *a.* Deck margin from vertex			·77, from opposite end			·45.
Sp. *b.*			·53,	„	„	·8.

Hab.—Mazatlan; abundant; *L'pool Col.*—(C. nivea)·Panama; under stones near low water mark, not common; *C. B. Adams.*—(C. squama) Panama, *Cuming*:—do. under stones and in dead shells near low water mark, not common; *C. B. Adams.*—(C. Lessonii) Isle of Muerte; under stones at low water; *Cuming*,—Panama, do. common; *C. B. Adams.*—Vancouver's Straits, *Mus. Cuming.*

Form squama. Tablet 1397 contains 8 sp. very young, of different sizes.—1398, 17 sp. different ages, striped.—1399, 5 sp. different ages, colour not conspicuous.

Form nivea, normal. Tablet 1400 contains 6 sp. finely grown, with brown rays outside.—1401, 6 sp. do. without brown rays.—1402, 7 sp. with broad laminated margin; one sp. measuring 1·7 outside, and 1·38 within; another, measuring ·97 within, has an apical margin ·32 across.—1403, 4 sp. rough, laminated outside.

Form striolata. Tablet 1404 contains 4 sp. beginning as squama, developing a few slight ridges.—1405, 5 sp. form nivea, irregularly developing ridges.—1406, 6 sp. ridges more developed; one being convex and closely ridged from the beginning.—1407, 2 sp. *Lessonii*-form developed, laminæ close.—1408, 3 do. very irregular. (The two larger sp. are from a dealer, locality unknown, but among other Mazatlan shells.)—

1409, 1 sp. finely developed, with coloured rays, laminæ concentrically striated.

Aberrant specimens. Tablet 1410 contains 1 sp. longitudinally ribbed (from adherent surface.) — 1411, 7 sp. margin irregular.—1412, 3 sp. margin curved.—1413, 3 sp. flat and recurved, form of C. unguiformis.—1414, 6 sp. posterior margin expanded.—1415, 3 sp. subspiral, approaching C. aculeata.—1416, 1 sp. deck elongated.—1417, 3 do. deck very short.—1418, 3 do. colour developed inside, brown passing into green.—1419, 1 sp. shewing under layer of deck, striated.—1420, 1 do. diseased.—1421, 1 do. deck solid, as in C. onyx.—1422, 1 do. flat, concentric striæ conspicuous.—1423, 3 do. longitudinally corrugated.

Tablet 1424 contains a portion of Spondylus calcifer, presented by R. D. Darbishire, Esq. containing in situ 4 sp. Petricola robusta, 1 Cumingia, 2 Lithophagus plumula, 1 Gastrochæna truncata, and 1 Crepidula nivea. This is greatly elongated, 1·55 by ·72, much arched, and with very numerous layers. Its position in a burrow of Lithophagus has preserved the apex from detrition.—1425, 1 sp. still more elongated, from the burrow of a Lithophagus in Chama, closely resembling C. explanata, *Gould.*

Specimens shewing deck margin. Tablet 1426 contains 3 sp. sinus slight, center more or less deeply angulated.—1427, 6 sp. sinus deep, center nearly straight, more or less angulated or sinuated.—1428, 1 sp. with abnormal central ridge.

Tablet 1429 contains 2 young shells which probably belong to this species, though the apex has been rubbed smooth.

342. Crepidula Unguiformis, *Lam.*

Patella crepidula, *Linn. Syst. Nat.* p. 1257, no. 752.—*Dillw. Descr. Cat.* p. 1021, no. 13.

Crepidula unguiformis, *Lam. An. s. Vert.* vol. vii. p. 642, no. 4.—*Brod. Proc. Zool. Soc.* 1834, p. 39.—*C. B Ad. Pan. Shells*, p. 230, no. 350.—(Ianacus u.) *H. & A. Ad. Gen.* i. p. 370.

Crepidula Italica, *Defr. Dict. Sc. Nat.* vol. xi. p. 397.

Crepidula plana, *Say, Journ. Ac. Nat. Sc. Phil.* vol. ii. p. 226. (teste *Gould & C. B. Ad.* non *Desh.*)

Comp. Patella Goreensis, *Gmel.* p. 3694.—*Dillw. Descr. Cat.* p. 1020, no. 12.—(Crepidula G.) *Desh.* in *Lam. An. s. Vert.*

vol. vii. p. 645, no. 10.—*Mke.* in *Zeit. f. Mal.* 1851, p. 36, no. 124.—(Crypta G.) *H. & A. Ad. Gen.* i. p. 369.—(Le Jenac,) *Adans. Coq. de Sen.* p. 41, pl. 2, f. 10.
For other references, v. *C. B. Ad.* loc. cit.

The late lamented and most accurate Prof. Adams, who in all other instances has created fresh species sooner than allow that the same shell could be common to the Atlantic and Pacific waters, has here, and here only, departed from his theory, and has quoted the above shell from the following six zoological provinces, to which we must now add a seventh :—1. Mediterranean—2. East coast of North America, North of Cape Cod.—3. Do. South of the Cape.—4. The Carribean waters.—5. West tropical America.—6. S. W. temperate region. Also fossil in Italy, Morea, Bordeaux, Dax and Touraine, *Desh.* "Fossil nel Piacentine e nel Sanese," *Broc.* And yet it is not impossible that in this his only instance, he may be in error; and that the shells he has quoted from Panama (with those of Brod. from Panama, perhaps from Chiloe,) are varieties of his own C. nivea; as the shells of D'Orbigny, quoted by him under this species, are said by Dr. Gray (*B. M. Cat. D'Orb. Moll.* p. 49, no. 418,) perhaps not correctly, to be varieties of C. dilatata. The form either of margin or of deck is not to be relied on in shells of this type.

On examining however the young shells classed as C. nivea, it was found that some of them differed from the rest in the following particulars. 1. The spiral vertex is much larger, being, in a shell ·095 long, ·025 across. 2. It is smooth, not concentrically wrinkled. 3. It is sunken in the produced margin of the shell, not prominent as in C. nivea. 4. It expands so evenly, that it is difficult to fix upon the point at which the spiral part ends. 5. The large spire shews conspicuously through the columellar lip, (at an angle from the deck, as in C. nivea.) 6. The epidermis appears much thinner. In all other respects, its mode of forming the deck, the shape of its margin, the white colour often streaked with brown, and the tendency to grow in layers, it agrees exactly with the larger species. Whether these characters are peculiar to the shells of the ordinary form Cr. unguiformis, which dwells in dead shells and is therefore liable to transportation through all seas, I cannot tell, as the vertices are rarely perfect, being lost at the advance of the shell. It is however worthy of examination by those who have access to young shells on the Atlantic coasts. That two shells, so very similar and similarly variable in the

adult state, should be so different in their early stage, is very remarkable. A series of specimens from the inside of a West African Pinna, of which the youngest is only ·04 long, agree exactly with the Mazatlan specimens now described. The largest, 1·18 in length, would certainly have been called C. squama if from Panama, though the epidermis is thinner than in the ordinary Mazatlan specimens. They go through the same changes of colour, deck margin, &c. as C. nivea; and if they had been born in an empty Cowry would probably have developed into the genuine C. unguiformis. As it is, they are probably the C. Goreensis,* a species which, according to Dillwyn, has a tendency (like C. nivea) to develop foliations. Whether the specimens quoted by Menke as C. Goreensis belong to this species or to C. squama, cannot be told without an examination of the vertex. Shells of exactly the same species, some extremely young and well formed, others of the true C. unguiformis shape, circular and elongated, were found in dead East Indian Cowries from Singapore The species may abound at Mazatlan; but as almost all the vast numbers of shells sent were perfectly fresh, there is no knowing what the dead ones contained. The largest Mazatlan shell with the apex perfect measures *long.* ·12, *lat.* ·08, *alt.* ·02. Others, which have lost the apex in growth, may belong either to this species or to C. nivea.

Hab.— Mediterranean, Africa, Singapore, North and South America, East and West; fossil in tertiary strata; *v. supra.*— Callao, Peru, very fine, in dead shells, B. M. Col. *D'Orbigny*, not in Cat.—Mazatlan; extremely rare, in dead shells, &c.; *L'pool Col.*

Tablet 1430 contains 3 sp. young.—1431, an adult sp. in empty Trivia radians.

Genus CRUCIBULUM, *Schum.*

Crucibulum, *Schum. Ess.* no. 8, 1817 :—*Gray, Proc. Zool. Soc.* 1847, p. 157, no. 270 :—*H. & A. Ad. Gen.* vol. i. p. 365.
Dispotæa, *Say, Journ. Ac. N. S. Phil.* vol. iv. 1124.
Calypeopsis, *Lesson*, 1830, *Brod.* 1834.

* The young of Cr. fornicata, as appears from specimens from Staten Island in the collection of R. M'Andrew, Esq. is of the type Cr. Goreensis, *Gmel.* but with only one large tumid whirl (as in Crucibulum imbricatum,) lying imbedded in the normal portion. Inside with first deck at an angle with the succeeding.

Distinguished by its complete cup, attached at its vertex, and generally more or less along one side.-- Great confusion attends the synonymy of the species, the names *extinctorium, rugosa, imbricata & auriculata* having been used by different authors to denote very different species.

343. CRUCIBULUM IMBRICATUM, *Sow.*

Calyptræa imbricata, *Sow. Gen.* f. 5.—*Desh.* in *Lam. An. s. Vert.* vol. vii. p. 636, no. 33.—C. (Dyspotæa) imbricata, *Mke.* in *Zeit. f. Mal.* 1847, p. 185, no. 36.—C. (Calypeopsis) imbricata, *B. M. Cat. D'Orb. Moll.* p. 47, no. 409.

Jun. = Calyptræa imbricata, *Brod. Proc. Zool. Soc.* 1834, p. 36:—*Trans. Zool. Soc.* vol. i. p. 193, no. 7, pl. 27, f. 7.—*C. B. Ad. Pan. Shells*, p. 222, no. 336.

= Crucibulum scutellatum, *Gray*, in Mus. Cuming. = Patella scutellata, [*Gray* in] *Wood*, (B. M. ms.) *Ind. Test. Suppl.* 1828, p. 26, pl. 8, f. 4.*

= Calyptræa (Calypeopsis) rugosa, *Less. Voy. Coq.* no. 158:—*Guer. Mag. Zool.* 1839, pl. 2.—(Non *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 637, no. 34: = C. lignaria, *Brod.*)

Var ? = Crucibulum ? imbricatum, *var.* Broderipii, *Proc. Zool. Soc.* June 1855.— = Calyptræa (Calypeopsis) rugosa, pars, *B. M. Cat. D'Orb. Moll.* p. 47, no. 408.

= Calyptræa auriculata, *P. P. C. Cat. Prov.* (non Chemn.)

+ "Calyptræa extinctorium?" *Sow. Gen.*† f. 3.—(Non *Lam. An. s. Vert.* vol. vii. p. 622, no. 1.)—Crucibulum extinctorum, *H. & A. Ad. Gen.* i. 366.

= Calyptræa rugosa, *Val. Voy. Ven.* pl. 14, f. 1, (male.)—*Rve. Conch. Syst.* pl. 141, f. 1.—(Non *Desh.* loc. cit.)

= Calyptræa (Dyspotæa) dentata, *Mke.* in *Zeit. f. Mal.* 1847, p. 185, no. 35.—*C. B. Ad. Pan. Shells*, p. 221, no. 334.

Jun. ? = Calyptræa auricularis, *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 639, no. 40: — *Enc. Méth.* Vers, vol. ii. p. 176, no. 18.—(Non Patella auriculata, *Chemn.*)

Comp. Calyptræa ?? imbricata, *var.* Cumingii, *Proc. Zool. Soc.* June, 1856.— = C. rugosa, pars, *D'Orb.* loc. cit. (non Desh.)

* Although this name was published first in time, yet as no description is given, and as the species cannot be recognized in the miserable figure, (as appears from its having been overlooked by both *Sow. & Brod.*,) it does not appear entitled to priority. For the same reason the P. Peziza is laid aside, which may be the C. spinosa, *Sow.*

† Of this shell no outside view is given; but as the inside exactly corresponds with the C. imbricatum, while it is given as a distinct species, it is fair to conclude that it is intended for the non-pitted variety of that form.

Comp. Calyptræa gemmacea, *Val. Voy. Ven.* pl. 15, f. 2. [If the figure be accurate, this is a distinct, tubercled species: but it may be a small, conical, worn C. imbricata; the quasi-tubercles being worn ribs.]

The *pitting* of the intercostal spaces which seems to form the ground of separation between C. imbricata of *Sow.* and C. dentata of *Mke.* appears so very variable a character, that I have not ventured to regard them as distinct. The Mazatlan specimens (when in sufficiently fine condition to speak with certainty) are never wholly without pits: yet they are completely irregular in their formation, often not being seen over a great portion of the surface; not unfrequently appearing on one side only; and very rarely traceable on the young shell. The species is normally rather solid, conical, with a very variable number (about 20) of stout rounded ribs, more or less spreading out at the margin. Fresh ribs are frequently formed in the intercostal spaces. When a fresh margin is formed below the palmations of the former one, a series of pits is produced. As the palmations are most developed in the adolescent state, so are the pits. They are rare in the older growth. Both ribs and intercostal spaces are finely, but irregularly indented with radiating corrugations. Fine radiating brown lines are often traceable outside, dotting the interior margin. The surface is generally rough and often covered with accretions; the vertex is rarely preserved.

In Mr. Darbishire's collection, is a specimen with the animal matter dried within, and the young fry covering the principal part of the inner surface of the shell. These are shaped like Vanikoro, about ·035 across; with the apex flat, not sunken; with one tumid whirl exposed, and a very large umbilical area. The surface is concentrically and very finely furrowed. Most of the specimens have made a faint lip over the base, with an edge which is to commence the margin of the Patelliform shell; but the cup is not begun. In this stage, the shell cannot be distinguished generically from Crepidula. The nuclear whirls are turned laterally with the plane of after growth (as in Capulus), perpendicularly to the base of the shell. The smallest specimen found in the adolescent stage is ·17 across; at which period it greatly resembles the young of Crepidula dorsata, the ribs not being developed. The cup is then semicircular, produced in front, adhering at the two separate margins. As it increases in size, the anterior margin bends round till it joins the posterior one, forming an entire cup, adherent almost to the

top. In this respect it differs from C. umbella, *Desh. (Lam. An. s. Vert.* vol. vii. p. 635, no. 30, = C. rudis, *Brod. Proc. Zool. Soc.* 1834, p. 35,) and the W. Indian form C. auriculata, *Chemn. Conch. Cab.* vol. x. f. 1623-9; of which, though common in S. W. Mexico *(P. P. C.)*, not a single specimen was found in the Mazatlan collection. This latter species is generally longer, more spreading, of a lighter colour, and with the cup only adherent close to the vertex. The ribs are also less developed, and never pitted. The Calyptræa auricularis of Deshayes may be the young of either species. The Mazatlan shell is generally of a rich metallic brown, displaying a lighter or deeper tint, sometimes nearly black; rarely of a light grey or flesh colour; occasionally tinted with green. The cup is always white, with transparent lines of growth. Its inner margin is scarcely flattened, and not angulated as in C. spinosa. When the creature lives on hard pebbles, there is generally an extremely thin shelly deposit: when on shells, a well marked excavation.

A flat, spreading sp. measures *long.* 2·1, *lat.* 1·8, *alt.* ·65.
A conical one „ „ 1·28, „ 1·15, „ ·72.

Hab.—Lower California, *Major Rich.*—Bay of Magdalena, Gulf of California, *Kellett.*—S. W. Mexico, *P. P. C.*—Acapulco, *Col. Jewett.*—Panama, very rare, *C. B. Adams.*—Mazatlan; not uncommon, on stones, dead shells, and each other; *L'pool Col.*—Straits of Magellan; [?] *Mr. J. Robertson*, B. M.

Tablet 1432 contains a group of the fry, presented by R. D. Darbishire, Esq.

Tablet 1433 contains 7 sp. very young.—1434, 5 do. young.—1435, 4 do. adolescent.—1436, 8 sp. shewing gradations of colour from very light to nearly black.—1437. 4 sp. varying from very much to scarcely pitted; margin much or scarcely palmated.—1438, 4 do. varying from very conic to spreading; ribs few (20), with large palmations, or many (42), with very small ones.—1439, 1 sp. with a young one adhering.—1440, 2 sp. worm-eaten, cup diseased.—1441, 1 sp. on Ostrea Virginica.—1442, a stone with thin shelly attachment.—1443, Uvanilla olivacea, with attachment of a Calyptræid.—1444, A fragment of primitive rock, with 5 sp. in situ: (presented by J. Hibbert, Esq.)

344. CRUCIBULUM SPINOSUM, *Sow.*

Calyptræa spinosa, *Sow. Gen.* f. 4: var? f. 7.—*Lam. An. s. Vert.* vol. vii. p. 636, no. 32.—Var. *Brod.* in *Trans. Zool. Soc.* vol. i. pl. 28, f. 8.—C. (Dyspotæa) sp. *Mke.* in *Zeit. f. Mal.* 1851, p. 36, no. 127.—(Crucibulum sp.) *H. & A. Ad. Gen.* i. 366.

= Patella Peziza, *Wood, (B. M. ms.) Suppl. Ind. Test.* 1828, p. 26. pl. 8, f. 3.

= Calyptræa tubifera, *Less. Voy. Ven.* pl. 14, f. 2. (Ordinary form, with short, crowded spines.)—"Dispolia" tubifera, *Say*, [probably a misprint,] in *B. M. Cat. D'Orb. Moll.* p. 47, no. 410.

= Calyptræa (Calypeopsis) auriculata, *D'Orb. B. M. Cat. Moll.* p. 47, no. 410.—(Non Patella auriculata, *Chemn.* v. *Proc. Zool. Soc.* June, 1856: comp. C. umbrella, *Desh.* = C. rudis, *Brod.)*

+ C. (Calypeopsis) tenuis, *Brod. Proc. Zool. Soc.* 1834, p. 36:—*Trans. Zool. Soc.* vol. i. p. 199, no. 9, pl. 27, f. 9.—*Lam. An. s. Vert.* vol. vii. p. 637, no. 35.

+ C. (Calypeopsis) hispida, *Brod. Proc. Zool. Soc.* 1834. p. 37:—*Trans. Zool. Soc.* vol. i. p. 200, pl. 27, f. 10.—*Müll. Sym. Nov. Test. Viv.* p. 144.—*Lam. An. s. Vert.* vol. vii. p. 638, no. 36.—*Rev. Zool. Cuv. Soc.* July, 1838.—*Chénu, Lec. Elem.* p. 144, f. 464.—*C. B. Ad. Pan. Shells*, p. 221, no. 335.—(Crucibulum h.) *H. & A. Ad. Gen.* i. 366.

+ C. (Calypeopsis) maculata, *Brod. Proc. Zool. Soc.* 1384, p. 37:—*Trans. Zool. Soc.* vol. i. p. 200, pl. 27, f. 11.—*Müll. Syn. Nov. Test. Viv.* p. 145.—*Lam. An. s. Vert.* vol. vii. p. 638, no. 36.—*Rev. Zool. Cuv. Soc.* July, 1838.—*C. B. Ad. Pan. Shells*, p. 223, no. 337.—(Crucibulum m.) *H. & A. Ad. Gen.* i. 366.—(Non C. maculata, *Quoy & Gaim. Voy. Astr.* vol. iii. p. 422, pl. 72, f. 6, 9:—*Lam. An. s. Vert.* vol. vii. p. 628, no. 10.

Comp. Calyptræa rugosa, *Desh. Enc. Meth.* Vers, vol. ii. p. 173, no. 9:—*Lam. An. s. Vert.* vol. vii. p. 637, no. 34.—(Non C. rugosa, *Less. Voy. Coq.* and *Guer. Mag.*: nec *Val. Voy. Ven.)*

= C. (Calypeopsis) lignaria, *Brod. Proc. Zool. Soc.* 1834, p. 36:—*Trans. Zool. Soc.* vol. i. p. 198, no. 8, pl. 27, f. 8.—Var. loc. cit. pl. 27, f. 8*.

+ Calyptræa (Calypeopsis) quiriquina, *Less.*, *B. M. Cat. D'Orb. Moll.* p. 47, no. 407.—(= C. Byronensis, *Gray* in *B. M.)*
+ Calyptræa (Calypeopsis) rugosa, pars solum, *B. M. Cat. D'Orb. Moll.* p. 47, no. 408; syn. plur. excl.

Comp. C. (Calypeopsis) radiata, *Brod. Proc. Zool. Soc.* 1834, p. 36:—*Trans. Zool. Soc.* vol. i. p. 198, no. 6, pl. 27, f. 6.—*Lam. An. s. Vert.* vol. vii. p. 635, no. 31.—*C. B. Ad. Pan. Shells*, p. 223, no. 339.—(Non C. radiata, *Desh.* 1836, *An. s. Vert.* vol. vii. p. 628, no. 11. = Galerus.)

It is not surprising that this beautiful species has been described under such a variety of names, as the differences between individuals are patent at first sight; their affinities only after a careful examination of a large multitude of specimens. And yet, though it would be most difficult to frame a description that should include the whole and exclude neighbouring species, the general habit of growth is such that it is not difficult to recognize. The Mazatlan specimens alone prove the C. tenuis, C. hispida and C. maculata, of *Brod.* to be merely forms of growth of C. spinosa, *Sow.*, which pass into one another by such gradual steps that they cannot be separated even as varieties. The supposed differences observable in the Cumingian types are as follows. C. imbricata, olim (one of two shells differing specifically from each other, and each claiming the name of *Brod.* to the confusion of students; an error now corrected) was the young state, before the cup is entirely formed: C. tenuis, the smooth, white, streaked form: C. hispida, the young state of the white shell, with small spines; C. maculata (non *Quoy*), a rather older stage, smooth and spotted. The C. radiata, in most respects agreeing with C. spinosa, differs in the remarkable flattening of the cup, and in its greater separation from the margin.

The C. quiriquina of Lesson and D'Orbigny, (which is the C. Byronensis, *Gray* ms.) belongs to a Southern type which may be distinct; though it has characters enough in common to make it not impossible that it is only a coarse variety. It is characterized by a more solid texture, light reddish brown colour, entire absence of spines, and a less angulated cup. To this form is referable, as an aberrant variety, the C. lignaria of *Brod.*, which is the C. rugosa of *Desh.* (not *Less.*) and in part of *D'Orb.* These shells are always conical and Hipponicoid; which is accounted for by their growing on a narrow base, either on small pebbles, or attached to each other. On

this form are sometimes seen faint radiating ribs, which are quite abnormal, and are perhaps due to the inconvenient shape into which the creature finds itself driven.*

* As D'Orbigny seems to have confounded both species and synonyms in this family, the following account of his type specimens in the Br. Mus. (mostly dead shells) may be useful to students. His own names and synonyms are given in quotations: the numbers are those on the tablets.

659, 560, "C. rugosa = imbricata, *Sow.*" are the true Crucibulum imbricatum; not C. rugosa, *Desh.*

561, "C. rugosa, *Desh.* = tenuis, *Brod.*" is neither one nor the other; but = C. ? imbricatum, var. Broderipii, *Proc. Zool. Soc.* June, 1856.

556, "C. rugosa, *Desh.* = rudis, *Brod.*" is neither; but appears the shell described in *Proc.* loc. cit. as C. ?? imbricatum, var. Cumingii.

562, "C. tubifora, *Less.* = spinosa, *Sow.* = auriculata, *Chem.*" is the true Crucibulum spinosum; but quite distinct from Patella auriculata, *Chem.* which appears to be the W. Indian form of C. umbrella, *Desh.* = rudis, *Brod.*

555, "C. quiriquina" is the dull, thick, spineless ? variety of Crucibulum spinosum, = Byronensis, *Gray.*

557, "C. rugosa, *Desh.*" is an interesting intermediate form between the last and the next, of the shape of Scurria mitra, *Less. & Esch.*, and sometimes developing a very few ribs.

558, "C. rugosa = lignaria," rightly named; the extreme form, like the large fossil Hipponyx.

560, "C. intermedia" is a Galerus, apparently distinct from any of Broderip's species.

565, "C. mamillaris, & C. lorica [?lichen] *Brod.*" is not the Galerus mamillaris, but the Galerus unguis, *Brod.*

567, "C. pileolus" intermediate in character between Galerus and Trochita.

- - -, "C. Patagonica" is probably a variety of Crepidula dilatata; as also may be - - -, "C. foliacea", in spite of its rugose surface.

573, "C. protea" are probably dead specimens of Crepidula incurva, or C. onyx, or both.

574, "C. protea" are perhaps C. nivea, as may be some of the specimens of C. Patagonica: but, along with the last, are too much worn for certain identification.

The following additional particulars of Mr. Broderip's species may also be useful to students.

Galerus unguis is very small, conical, and dark coloured. G. sordidus appears a flatter, lighter variety of the same species. Mr. Cuming's specimens are all covered with Bryozoa; but none of them show any tendency towards the corrugated exterior represented in the *Trans. Zool. Soc.* pl. 28, f. 2.

Galerus striatus is well distinguished by its strongly sculptured exterior.

Crepidula marginalis is intermediate in characters between C. onyx and C. aculeata; having the external appearance of the former, with a thin waved deck more resembling the latter.

Crucibulum serratum outside resembles Cr. ?? imbricatum var. Cumingii: but within, it has a remarkably appressed and angular cup. It comes more close to Cr. pectinatum, *Proc. Zool. Soc.* June, 1856.

Crucibulum spinosum begins life as a smooth Velutina-shaped body, about ·03 across, scarcely differing from the young of C. imbricatum, *Sow.* As it spreads out, it commences its cup as a Crepiduloid deck, growing like that of Crepidula nivea, but at a greater angle. This is soon developed into a semicircular lamina, much flattened at the posterior end, and in the same proportion produced anteriorly. On the smooth surface are first developed fine striæ; then rather irregular but fine corrugations, radiating to the margin as in Patella, not following the spiral growth of the shell. These corrugations are sometimes decussated by the lines of growth, which occasionally develop concentric laminæ, as in Crepidula Lessonii. Over these corrugations appear, not in the same direction, but in lines more or less spirally diagonal, and more or less irregular, either small tubercles, or very small tubular spines, generally open at the top, and, when close to the margin, at the bottom also. The spines are often very long, either on a portion or on the whole of the shell. Sometimes a few rows are predominant, as in C. hystrix, *Brod.*: sometimes all are alike and very crowded. In this state, the corrugations often disappear, developing themselves into spinous processes. It is common to find a shell smooth on the principal part, then suddenly developing spines at one corner; or sometimes a shell, which was spiny in its earlier stage, goes on smooth. In shape there is the same diversity. Most of the young shells are rather conical: but they generally develop in a more or less expanded form, sometimes nearly flat. Mr. Cuming has a most wonderful specimen (figured in the *Trans. Zool. Soc.* pl. 28, f. 8), which he extracted from a spherical hole in a large stone brought up from deep water. After beginning in the usual conical way, it had spread out almost flat, the cup projecting far beyond the base of the shell, and the enormously large spines being recurved above the vertex. The life of this creature must have been perfectly sedentary. Other specimens however, after beginning with an uneven and broken margin, appear to have gone in quest of more quiet abodes, and have continued as flat and regular shells. The margin is either entire, slightly crenulated by the corrugations, or beautifully indented and pierced by the tubes, according to circumstances. The cup is adherent for about two-thirds of its height; very rarely to near the top, as in C. imbricatum. It is always flattened at the inner posterior portion, with a more or less defined angular groove, separating the flat from the swollen portion. It is white, with transparent lines of

growth in the lower part; towards the apex stained with chesnut in the dark shells. The colour of the interior varies from pure snow white to very dark brown; generally more or less spotted or rayed with chesnut. The finest specimens were eagerly caught up by collectors: the largest I could find measures *long.* 1·72, *lat.* 1·5, *alt.* ·98.
A flat sp. „ 1·3, „ 1·13, „ ·27.

Hab.—(C. tenuis) Samanco Bay, Peru; on living shells, in muddy sand, 9 fm.; *Cuming.*—(C. hispida) Isl. Muerte; on dead shells, in sandy mud, 12 fm.; *Cuming.*—C. maculata) Do. 11 fm. *Cuming.*—Panama; under stones at low water mark, rare; *C. B. Adams.*—San Diego, *Lieut. Green.*—Monterey; very rare; *Nuttall.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 1445 contains 3 sp. extremely young.—1446, 3 do. a stage older.—1447, 4 do. adolescent: on one a young Crepidula aculeata has fastened itself, wearing away the spines.—1448, 1 sp. adult, with attachment of another.

Specimens shewing form. Tablet 1449 contains a series of 9 sp. from very flat to conical.—1450, 3 sp. shewing crenations of the margin.—1451, 4 do. margin very irregular.—1452, 4 sp. curiously deformed and thickened by disease.

Specimens shewing changes of surface. Tablet 1453 contains 3 sp. nearly smooth.—1454, 4 do. tubercular spines developing.—1455, 4 do. spines regular and crowded.—1456, 6 sp. some spines greatly developed.

Specimens shewing colour. Tablet 1457 contains 4 sp. white, developing chesnut rays.—1458, 5 do. light brown, scarcely or generally diffused.—1459, 4 do. tortoiseshell pattern.—1460, 4 do. tortoiseshell changing into dark brown.

Genus CALYPTRÆA, *Lam.*

Calyptræa auct. (pars.) Subgen. Calyptræa, *b. Less. Brod.*
Calyptra, Humph. 1797, (pars). *Gray, Proc. Zool. Soc.* 1847, p. 157, no. 271.—*H. & A. Ad. Gen.* i. 364.
Mitrularia, *Schum.* 1817, *Ess.* no. 9.—*Phil. Handb. Conch.* p. 186.
Lithedaphus, *Owen, Proc. Zool. Soc.* 1842, p. 147.—Litholepas, *Gray,* loc. cit.
Cemoria, *Risso,* 1826; non *Leach,* nec *Swains.*

This group, first distinguished by *Schum.*, is characterized by its free, semi-tubular lamina, like a cornucopia divided longitudinally. It may be regarded as a Crepidula with each marginal sinus intensified; or as a Crucibulum with the lamina free instead of being turned round upon itself. A full description of the animal of one species is given by Owen, *loc. cit.* It is probable that the young will be found to commence like Crepidula. The genus is represented in the Mazatlan collection by a single specimen. In all the species examined, the plane of increase is more or less perpendicular to the base, as in Capulus. The habit of growth is generally extremely irregular, as in Hipponyx, which at least some of the species resemble in possessing a shelly plate of adherence. As far as can be judged by the specimens in the Cumingian Museum, the species which Brod. has constituted in this group are all well founded. C. corrugata has an exterior like Crucibulum umbrella, *Desh.* (=rudis, *Brod.*) The other three species differ in the growth of the cup: that in C. cepacea is produced forward, and occupies not much more than a semicircle; in C. varia, it grows straight up, occupying three-fourths of a circle; in C. cornea, it is compressed, lengthened, with projecting points, and the opening very small.

345. CALYPTRÆA CEPACEA, *Brod.*

Proc. Zool. Soc. 1834, p. 35.—*Trans. Zool. Soc.* vol. i. p. 197, pl. 27, f. 4.—*Müll. Syn. Nov. Test. Viv.* p. 142.—*Lam. An. s. Vert.* vol. vii. p. 633, no. 24.—*Rev. Zool. Cuv. Soc.* July, 1838.—*Chénu, Lec. Elem.* p. 144, f. 1462.—*Mke. Zeit. f. Mal.* 1851, p. 36, no. 128.—*C. B. Ad. Pan. Shells*, p. 220, no. 332.

This shell is easily distinguished from the W. Indian species, C. equestris, &c. both by the vertex and the markings. The nucleus consists of an elevated spiral body, like Bithinia. (The apex is unfortunately wanting.) The spire axis is fixed horizontally. The sculpture of the shell consists of extremely fine, close, radiating lines, which under the microscope are found to be sharp ridges, with semicircular spaces between, crowded with concentric (semicircular) striæ. *Long.* ·54, *lat.* ·65, *alt.* ·23.

Hab.—Isl. Muerte; on dead shells, in sandy mud, 11 fm.; *Cuming.*—Panama; extremely rare, on dead shells, at low water mark; *C. B. Adams.*—Mazatlan, Menke:—one sp. *L'pool Col.*

Tablet 1461 contains the specimen.

Family CAPULIDÆ.

Genus HIPPONYX, *Defr.*

Cochlolepas, *Klein.* 1753:—*H. & A. Ad. Gen.* vol. i. p. 373. (Non Concholepas, *Lam.*)

346. Hipponyx serratus, *n. s.*

H. t. conicâ seu depressâ, albâ; apice decollato, subcentrali seu valde remoto, interdum valde prominente; lamellis crebris, acutis, extantibus, basi parallelibus, concentricè ornatâ; apicem versus radiatim costatâ; supra lamellas radiatim tenuissimè sulcatâ; basi latissimâ, planatâ, lamellis creberrimis instructâ; lamellis profundè serratis, lobis subquadratis; inter lamellas epidermide fuscâ vopiosissimè indutâ, tæniis incisis confertâ; cicatrice musculari transversim corrugatâ.

Proc. Zool. Soc. 1856, p. 3, no. 2.

?= Hipponyx foliaceus, *Mke.* in *Zeit. f. Mal.* 1851, p. 36, no. 129, non *Quoy & Gaim.*

This well marked species differs from H. antiquata, *Linn.* in the character of the base, which is broad and flat, made up of very numerous, close-set lamellæ, deeply serrated into large scarcely rounded lobes. The interstices are filled with epidermis, in irregular ribband-like shreds as in Byssoarca Pacifica. The exterior, which rarely displays its characters satisfactorily, has slight tubercular ribs near the apex, which are continued over the lamellæ as very fine, rather distant, indented striæ. The apex is sometimes flat, sometimes high and curved back as in Emarginula rosea. It is always decollated and eroded. One extremely young specimen has the minute helicoid apex adhering to the spreading, rounded shell. The shelly base is almost always very thin and smooth, sometimes scarcely perceptible. It is nearly related to an Australian species, probably H. foliaceus, *Quoy;* but in that species the lamellæ are serrated outside with the strong radiating sulci; the lobes of the basal laminæ are more rounded; and the epidermis is finer and lighter. The largest specimen measures (from the very projecting apex) *long.* ·96, *lat.* ·94, *alt.* ·46.

A very flat sp.	„ ·86,	„ ·78,	„ ·25.
A very conical sp.	„ ·68,	„ ·73,	„ ·43.

Hab.—Mazatlan; gregarious, attached to each other, or on shells, (Byssoarcæ, &c.) rare; *L'pool Col.*

Tablet 1462 contains an extremely young sp. with the helicoid apex.—1463, 2 young sp., one on Byssoarca solida.—1464, 1 sp. with exterior beautifully perfect.—1465, 2 sp. one very flat, the other very conical.—1466, 2 distorted sp. of which one is shaped like Amathina, *Gray*.—1467, 1 sp. probably old, with the margin narrowed inside by non-serrated laminæ.—1468, 3 sp. shewing basal supports on the outside.

347. HIPPONYX ANTIQUATUS, *Linn.*

Patella antiquata, *Linn. Syst. Nat.* p. 1259.—*Gmel.* p. 3709.—*Mont. Test. Brit.* p. 485, pl. 13, f. 9.—*Dillw. Descr. Cat.* p. 1035, no. 44.
= Lepas alba, *Mart. Conch.* pl. 12, f. 111-2.
+ Patella Mitrula, *Gmel.* p. 3708.
+ Patella nivea, *Gmel.* p. 3727.
Le Soron, *Adams. Sen.* p. 32, pl. 2, f. 3.
Pileopsis antiquata, *Forbes & Hanl. Br. Moll.* vol. ii. p. 462.
Hipponyx antiquatus, *Mke. in Zeit. f. Mal.* 1853, p. 79.—*Proc. Zool. Soc.* Jan, 1856, p. 3.
Cochlolepas antiquatus, *H. & A. Ad. Gen.* i. 373.
= Pileopsis mitrula, *Lam. An. s. Vert.* vol. vii. p. 610, no. 2.
Capulus mitrula, *Dunk. Ic. Moll. Guin.* p. 36, no. 99.—*B. M. Cat. Cuba Moll.* p. 32, no. 390.
Hipponice mitrale, *Defr. Journ. Phys.* 1819, f. 4.—*Blainv. Malac.* pl. 50, f. 4.
Hipponyx mitrula, *Sow. Proc. Zool. Soc.* 1835, p. 5 :—do. *Thes. Conch.* (inter Brachiopoda, Nov. 1846) p. 369, no. 2, pl. 73, f. 18—20.
Hipponyx Panamensis, *C. B. Ad. Pan. Shells*, p. 218, no. 328.
Amalthea Panamensis, *H. & A. Ad. Gen.* i. 374.

Known from H. serratus by the rounded base. Sowerby's species was described, as of *Lam.* from Peruvian shells brought by Mr. Cuming. Prof. Adams, finding certain differences of form and markings between his Panama and Caribbæan specimens, gave the Pacific shells a fresh name. Both these and the Atlantic forms are however extremely variable in shape and details of sculpture.—Only three Mazatlan shells are referable to this species; one, although only ·062 long, has its apex decollated, is compressed and conical, with the beak much recurved, and has very fine, close, radiating striæ, interrupted by lines of growth; the second, flattened and extremely worn, is curiously indented in the region of the head; the

third, in fresh condition, is immature, with the apex but slightly recurved, and the radiating striæ very coarse, while the concentric laminæ are but slightly developed. Epidermis in shaggy layers between the laminæ. *Long.* ·34, *lat.* ·3, *alt.* ·18.

Hab.—W. Indies, passim.—Cuba, *Sagra.*—Barbadoes, *Dr. Cutting.*—Senegal, *Adanson.*—Loander, *Tams.*—St. Vincent, W. Africa, *Schmidt.*—Lobos Is., Peru; on stones, among coarse sand, 17 fm.; *Cuming.*—Panama; 14 sp. on stones and shells near low water mark, with thin attached valves; *C. B. Adams.*—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 1469 contains the 3 specimens.

348. HIPPONYX PLANATUS, *n. s.*

H. t. valde planatâ, subovali, albâ; vertice anfr. ii. *rapidè augentibus, lateraliter incumbentibus, interdum persistente; t. juniore sparsim radiatim costatâ; postea laminis concentricis à sulcis radiantibus indentatis, ad marginem t. juniore profundè, t. adultâ vix serratis; epidermide tenui, laminas intercalante; intus valde politâ, cicatr. musc. angustâ, circulari, regione capitis interruptâ; margine producto, simplici, intus rotundato, extus tenuissime serrato; valvâ inferiore tenui (t. juniore) multo minore, usque ad regionem cicatricis solum continuâ.*

Three very small specimens of this species were found in the Spondylus washings; but Mr. Darbishire was fortunate enough to find a beautiful young shell in a Lithodomus burrow in situ; too late for the list in the *Proc. Zool. Soc.* Afterwards some large adult upper valves were brought by Mr. Bridges. All agree in the extreme flatness, torque-shaped muscular scar, finely cancellated laminæ and rounded but spreading margin. The spiral apex, being recumbent and rather solid, has remained on two of the specimens, a very unusual thing in the genus. It is known from even the flattest specimens of H. antiquatus by the shape of the scar, spreading margin, recumbent apex, and sparse radiation of the earlier portion. The youngest shell is ·07 across, with the Helicoid whirls about ·015 in diameter. The most perfect specimen in Mr. Cuming's collection (not the largest) measures *long.* ·73, *lat.* ·64, *alt.* ·17.

Hab.—Mazatlan; on Spondylus, extremely rare; *L'pool Col.*—Bay of Panama, *T. Bridges*, Mus. Cuming.

Tablet 1470 contains the youngest and an adolescent sp.

349. HIPPONYX BARBATUS, *Sow.*

Proc. Zool. Soc. 1835, p. 5 :—*Thes. Conch.* (Brachiopoda,) p. 369, pl. 73, f. 26, 27.—*C. B. Ad. Pan. Shells*, p. 217, no. 327.—*Proc. Zool. Soc.* 1856, p. 3, no. 3.

?=Hipponyx australis, *Mke.* in *Zeit.* f. *Mal.* 1847, p. 186, no. 38: non H. australis, *Desh.*=Patella australis, *Lam.*

Shell commencing as a helicoid body with nearly two whirls; apex more or less sunken; smooth, with the lip entire as in Cyclostoma. It then spreads out, develops slight striæ, and long star-like rows of hairs, the mouth expanding downwards as in Helix. The spiral part remains longer than in most Hipponices; the shell also is elongated. A young specimen had eaten its way into the shell of Murex princeps, without shelly attachment, as in Amalthea. No attachment was found with the adult shells, while in Mr. Cuming's specimens it is enormous. Shell when mature with close nodulous ribs, each armed with a row of bristly hairs. Inner margin rounded, crenulated by the ribs outside. Colour white, more or less tinged with rufous brown *Long.* ·65, *lat.* ·54, *alt.* ·22.

Hab.—Coral reefs round Toobouai, Soc. Is. *Cuming.*—Panama; on stones and shells near low water mark, rare; *C. B. Adams.*—Mazatlan; young rare, adult very rare, on Spondylus calcifer, &c.; *L'pool Col.*

Tablet 1471 contains 6 sp. extremely young, the smallest ·02. across.—1472, 5 sp. different ages.—1473, 2 sp. jun. off Murex princeps, very elongated form.

350. HIPPONYX (AMALTHEA) GRAYANUS, *Mke.*

Zeit. f. Mal. 1853, p. 115.—*Proc. Zool. Soc.* 1856, p. 4, no. 4.

Hipponyx radiata, *Gray, Proc. Zool. Soc.* 1835.—*C. B. Ad. Pan. Shells*, p. 218, no. 329.—*Mke.* in *Zeit. f. Mal.* 1853, p. 79. (Non H. radiata, *Quoy & Gaim.* 1824: nec H. radiata, *Desh.* 1830, in *Lam. An. s. Vert.* vol. vii. p. 616, no. 6;= H. crispa, *Mke.* loc. cit.)

Only one small dead shell was found, which probably belongs to this species. Although only ·06 across, the apex is decollated. In well developed specimens, the ribs are fewer, coarser and more nodulous than in H. barbata. The epidermal hairs are softer, smaller, fewer, and irregularly scattered. The apex is subcentral. Base rounded within, flattened externally,

where it is crenated by the ribs, with numerous lamellæ, undulated, not serrated.

Hab.—Gallapagos, *Cuming.*—Sandwich Is. on Pinna, *Nuttall.*—Panama, 16 sp. on stones, near low water mark; *C. B. Adams.*—S. W. Mexico, on Pinna, *P. P. C.*—St. Vincent (Guinea) *Schmidt*, teste Menke.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1474 contains the specimen.

Genus CAPULUS, *Montf.*

Capulus, *Conch. Syst.* II. 54, 1810.—*Phil. Handb. Conch.* p. 188.—*H. & A. Ad. Gen.* i. 371.
Pileopsis, *Lam. Extr. Cours.* 1812.
Amalthea, pars, *Schum. Ess.* p. 181, 1817.

351. Capulus ————, *sp. ind.*

Tablet 1475 contains 3 apical fragments which may be conspecific, though they differ somewhat in sculpture and outline. They appear nearly related to the W. Indian Patella militaris, *Linn.* The vertex has two tumid helicoid whirls, of which the upper is prominent, in this respect differing from the supposed young of Hipponyx serratus.

Hab.—Mazatlan; 3 sp. on Spondylus; *L'pool Col.*

Family VERMETIDÆ.

Neither animals, shells nor opercula in this family have yet been studied by travelers, as much as from their diversity and aberrant characters they deserve. The species are extremely difficult to discriminate by the shells alone. Habit of growth and colour appear to be of more consequence than the variable details of sculpture. The figures of Chénu and Valenciennes, unaccompanied by either description or geographical information, are rather calculated to confuse than to aid the student. Remarkable variations were found among the opercula, which, from their occurring among the Spondylus washings, and from their not being admissible in any other direction, appear to belong to this family: but only in regard to two species can

they be determinately referred to the shells. The two are therefore described separately, leaving their union to future researches. The arrangement of generic sections is simply provisional.

Genus SIPHONIUM, *Browne.*

Testa valde irregularis, juniore haud turritelloideâ. Operculum tenue, concavum, haud laminatum.

Section A. Species typici.

Operculo valde concavo, vix spirali. Species oceanis Atlantico et Orientalibus repertæ.

B. Subgenus ALETES.

Operculo parum concavo, multispirali, sæpe irregulariter formatum.

It might have been thought that the turritelloid opercula would have belonged to the turritelloid shells. Such however is not found to be the case; the opercula of V. lumbricalis, Hindsii, &c. being formed on the laminated type, with a very large outer whirl. Without a knowledge of the animals or the operculæ, these shells can hardly be separated even specifically from those of Siphonium proper and Serpulorbis.

352. Aletes centiquadrus, *Val.*

A. t. magnâ, pallidè, interdum intensius rufo-fuscâ; anfr. nucleosis parvis, lævibus, globosis, spirâ vix monstrante; dein anfr. rapidè augentibus, separatis; interdum irregulariter spiralibus, ad ang. 25°, interdum varie contortis; seu segregatis, seu glomeratis; conchis et rupibus parum affixâ, facile separatâ; superficie plerumque spiraliter densè rugosâ, lineis incrementi transversis decussantibus, interstitiis subprofunde punctatis: paginâ omnino inferiore et interdum, testâ adultâ, totâ superficie sculpturâ obsoletâ; basi interdum planatâ, angulatâ; transversim interdum septo concavo divisâ.

Operculo parvo, dimidio aperturæ æquante; extus concavo; in medio lævore, structurâ vix conspicuâ, apice planato; marginem versus multispirali, marginibus anfractuum haud plurimo-

rum lævibus, parum elevatis, haud (normaliter) separatis : intus convexiore, cicatr. musc. mediano, circulari, magnâ, irregulariter concentricè rugulosâ ; marginem versus anfractus monstrante.

Vermetus centiquadrus, *Val. Voy. Ven.* pl. 11, f. 1, 1*a*, 1*a bis*.
+ Vermetus Peronii, *Val. loc. cit.* f. 3, 3*a*.

The operculum appears intermediate in character between the regularly multispiral operculum supposed to belong to a species of this group, and the deeply concave, paucispiral operculum of Siphonium giganteum. One specimen found in situ, (by which, along with two others scarcely admitting of doubt, the rest were identified,) has not more than half the diameter of the aperture. Most of the few found were more or less irregular; the edges having a tendency to separate elevation, and the whirls to become fewer after fracture.

The V. Peronii, a group of which is figured on Strombus galea, fixing the locality of the species, appears only to differ from V. centiquadrus in the absence of punctures: but as both states are frequently found on the same specimen, it cannot warrant specific separation.

The shell is loosely adhering, and of very irregular habit of growth: when spiral, with rapidly diverging whirls. The sculpture is close, and seldom much impressed. The colour is laid on here and there in blushes. An average specimen measures as it stands *long.* 2·4, *lat.* 1·4, *diam.* ·44.

Hab.—Mazatlan; not uncommon on Spondylus and Chama; also on stones and other shells; *L'pool & Havre Coll.*

Tablet 1476 contains an extremely young sp. with apex enveloped; also one somewhat older.—1477, a young sp. growing straight, on Conus gladiator.—1478, an adolescent sp. covering an extremely deformed Crepidula aculeata. On the back are some egg-cases, and on the same tablet a similar group.—1479, 2 sp. intertwined with spiral growth; also a fragment shewing septa.—1480, a sp. on Vitularia salebrosa. On reaching the canal, it has left its mouth, and twisted back at right angles.—1481, a specimen on rock, growing upwards, spirally twisted on itself.—1482, a large group off Spondylus, with Petaloconchus, Annelids, &c.—1483, an operculum as found in a fragment of the shell; also 4 separate opercula, of which 3 are abnormal.

352 *b*. ALETES ? CENTIQUADRUS, *var.* IMBRICATUS.

A. t. "A. centiquadro" simili, sed colore intensiore ; rugulis spiralibus parvis, confertissimis, haud decussatis, squamulis

arcuatis ornatis; decumbente, vix spirali, pertinaciter affixâ, superficiem matricis parum erodente.

Only one characteristic and one rubbed specimen were found of this shell, which may be a Spiroglyphus. It has however some characters in common with the young of the great Californian Vermetid, Aletes squamigerus. *Long.* 6, *lat. apert.* 13.

Hab.—Mazatlan; extremely rare, on Uvanilla and Cuma; *L'pool Col.*

Tablet 1484 contains the characteristic sp.

353. ALETES MARGARITARUM, *Val.*

A. t. "A. centiquadro" simili, sed anfr. nucleosis iii. *magis elongatis; anfr. normalibus rapidè augentibus; adultâ subquadratâ, ad angulas carinis nodosis conspicuè ornatâ; liris tenuioribus, vix decussatis.*

Vermetus margaritarum, *Val. Voy. Ven.* pl. 11, f. 2.

Only one adult and two extremely young sp. were found, which may not be conspecific. The nuclear whirls are not globular, as appears the case in the only specimen seen of V. centiquadrus; in this respect it is intermediate between that species and Bivonia. *Long.* 1·1 *lat. apert.* 3.

Hab.—Mazatlan: extremely rare, on Spondylus; *L'pool Col.*

Tablet 1485 contains the youngest and the adult specimen.

GENUS VERMETUS, *Adanson.*

Testa plus minusve spiralis. Operculum magnum; extus laminis concentricis foliaceis instructum: intus marginem versus convexum; cicatrice musculari circulari, concentrice cælatâ.

Sen. p. 160, 1757.—*H. & A. Ad. Gen.* vol. i. p. 357.

SECTION A. SPECIES TYPICI.

Testâ juniore turritelloideâ. Operculo colore corneo, tenuiore, extus foliaceo; cicatrice concentricè lirulatâ.

The turritelloid Vermetidæ form a small but natural group; of which the species are distinguished by the sculpture of the spiral portion, and of the operculum.

354. VERMETUS EBURNEUS, *Rve.*

V. t. albâ, seu rubro-fusco tinctâ, satis magnâ; anfr. spiralibus albis x.-xiv.; *primis* iii. *valde rotundatis, lævibus; dein carinâ unâ acutâ, dein duabus, postea tribus monstrantibus, quarum una circa peripheriam major; postea subito irregulari, anfr. separatis, vix spiralibus, marginibus plerumque valde divergentibus, parum seu ad sese, seu ad concham alienam affixis; spiraliter tenuè et confertim striatâ, costis interdum subobsoletis; adultâ interdum rufo-fusco tinctâ.*

Operculo extus concavo; foliis plurimis tenuibus alterâ intus alteram sitâ; radiatim tenuissimè striulato, striulorum interstitiis punctulatis; intus marginem versus convexo, opaciore, margine tenuissimo; cicatrice circulari, trienti latitudinis haud æquante, lirulis circiter xii. *concentricis ornato.*

Proc. Zool. Soc. 1842, p. 197:—*Conch. Syst.* vol. ii. p. 46, pl. 152, f. 2.

Comp. Vermetus pellucidus, *Brod. & Sow. Zool. Journ.* vol. iv. 1829, p. 369. "*V. t. pellucidâ, longitudinaliter striatâ, apicem versus carinatâ.*" (This description will suit the young of V. eburneus, but is not sufficiently explicit for certainty.)

The operculum is described from specimens in Mr. Cuming's collection, which are believed to be authentic, as they agree with that of V. Hindsii in the B. M., though differing essentially from the figure professing to be of that species in *H. & A. Ad. Gen.* pl. 38, f. 8, *a*, *b*. An operculum agreeing even in the peculiar microscopic markings is seen in Mus. Cum. in a very different shell, which has lost its apex, but is probably an Aletes, and s not unlike A. squamigerus. The V. Hindsii seems to differ from V. eburneus in the arrangement of the keels on the turritelloid portion.

About 30 young specimens of this very beautiful species were obtained on Chamæ and Spondyli; but only two were found adult, loosely entwined on a Chama. These, having passed through the acid process, have lost their sculpture and would hardly be known from A. centiquadrus, (with which the later whirls agree in colour,) but for the Turritelloid apices, which have fortunately survived. The sudden contrast between the elegantly chiseled, alabastrine Pseudo-Turritella, and the irregular, almost smooth subsequent whirls, is very remarkable. A fossil species found by Mr. Nuttall at Newburn, N. Carolina, differs essentially from the Atlantic species, and offers no marks by which it has been distinguished from this.

The longest spire measures ·41 by ·14; the adult, *long.* 1·9, *diam. apert.* ·5.

Hab.—Mazatlan; extremely rare, on Chamæ and Spondyli; *L'pool Col.*

Tablet 1486 contains 1 extremely young and 1 adult spire.—1487, 2 sp. irregular portion commencing: one has cemented to itself the valve of a Donax.—1488, the adult specimens, on Chama frondosa (Mexicana.)

Section B. BIVONIA, *Gray.*

Testa solutè spiralis, nunquam turritelloidea: Operculo rubro, solidiore, extus parum foliaceo, intus cicatrice corrugatâ, plerumque vix concentricè lirulatâ, sæpe umbonatâ.

(Diagn. carent.) *Proc. Zool. Soc.* 1847, p. 156, no. 258:—*Fig. Moll. An.* p. 82, no. 3; "operculum rudimentary, small, (?spiral.)"—*H. & A. Ad. Gen.* vol. i. p. 358; "operculum red, convex in the middle, with a thin, flat margin, and a central muscular scar."

The name is retained for the typical species quoted by Dr. Gray in default of description. It was natural that Bivon and Philippi should not be agreed in their account of the operculum of V. glomeratus, *Phil.* as the concentric elements present a very spiral appearance, and the outside is almost always incrusted with coralline &c. which, even if removed, probably carries off the foliated surface along with it. The genus, as afterwards defined by Dr. Gray, "operculum small, rudimentary," applies better to what little is known of Petaloconchus, one species of which inhabits the Mediterranean.

355. ?Bivonia contorta, *n. s.*

?B. t. minore, rubidâ, cancellatâ; anfr. nucleosis iii. *lævibus, elevatis; normalibus irregulariter uno super alio decliviter et spiraliter incumbentibus, marginibus sæpe vix parallelis: plerumque solitariâ, conchis variis basi totâ tenuè adhærente; sculpturâ ut in A. centiquadro; aperturâ rotundatâ.*

Comp. Vermetus glomeratus, *Rouss.* in *Chénu Ill. Conch.* pl. 2, f. 2 (1843).—*Mke.* in *Zeit. f. Mal.* 1847, p. 178, no. 4:—do. 1850, p. 165, no. 14.—*C. B. Ad. Pan. Shells*, p. 216, no. 323.

Hab.—Panama; attached by a small part of the spiral por-

tion of the shells to rocks and stones, near low water mark of neap tides, not uncommon; *C. B. Adams.*

Comp. Vermetus Panamensis, "*Rouss.* in *Chénu, Ill. Conch.* pl. 5, f. 1."—*Mke.* in *Zeit. f. Mal.* 1850, p. 165, no. 13.—*C. B. Ad. Pan. Shells,* p. 216. no. 324. *Hab.*—Mazatlan; in mass of coral, on Spondylus; *Menke.*—Panama; in the same situations as V. glomeratus, attached on one side of all the whirls; *C. B. Adams.*

This species may possibly be the V. glomeratus of *Mke.* and *C. B. Ad.*: but as it is not the S. glomerata of *Linn.* (v. *Hanl. Ips. Linn. Conch.* p. 444,) nor the V. glomeratus of *Phil.*, which has a peculiar habit of growth, it does not seem fair to adopt the name figured only in Chenu, especially as that appears a third species, judging by the size and colour.*—The shell may again prove to be the V. Panamensis of the same authors; but the figures cited do not appear with that name, but with that of V. lumbricalis, *Lam.* There can scarcely be a doubt that they represent the species of Adanson "Le Vermet": as to whether that be the real V. lumbricalis of *Lam.*, v. *Desh. An. s. Vert.* vol. ix. p. 66, no. 1. Whether this again be the S. lumbricalis of *Linn.*, v. *Hanl. Ips. Linn. Conch.* p. 445.

The shell is much more uniform in diameter and more parallel in spire-margins than A. centiquadrus, jun. which it resembles in sculpture, and mode of attachment. The colour is however generally with more of a pink and less of a brown tinge. The nuclear whirls resemble Rissoa. It is known externally from Petaloconchus macrophragma, which it resembles in mode of growth, by its much ligher colour, without purple tinge. An extremely fine specimen, from the Gulf of California, is in Mr. Cuming's collection. A closely related, if not identical species is found in the W. Indies. *Long.* 9, *lat. apert.* 14.

Hab.—Mazatlan; not uncommon, on Spondylus, Gadinia, and other shells; *L'pool Col.*

Tablet 1489 contains 4 sp. very young.—1490, 1 sp. on fragment of Pinna, and several young on Gadinia pentegonio-

* Or C. B. Adams' V. glomeratus may be the Aletes centiquadrus, which is cited under query in the *Pan. Shells* as a synonym. A different species from either, though intermediate in character, was brought from Panama by Mr. Bridges, and may be the V. Panamensis. ? Has Prof. Adams in this genus alone taken his synonyms on trust, and copied the species of Menke's Catalogue. This at least will explain the confusion. Mr. Bridges' shell was at first believed by Mr. Cuming and myself to be a Petaloconchus, in consequence of the edges of a minute Isognomon appearing inside a broken section. After opening several parts in hopes of observing the structure, the bivalve fell out, and the Vermetid subsided into Bivonia.

stoma.—1491, 1 sp. on fragment of Spondylus, with Bryozoa, &c.—1492, 1 sp. on Uvanilla unguis.—1493, 2 separate sp., of which one has deep sculpture.

355 *b*. PBIVONIA PCONTORTA, *var.* INDENTATA.

B. t. "*B. contortæ*" *simili, sed minore ; colore haud roscâ ; sculpturâ indentatâ ; costis paucioribus ; interstitiis profundis, cancellatis.*

This form would hardly be distinguished as a species from the shell alone, so variable is the sculpture of Vermetidæ, even on the same specimen ; but as it is not improbable that the second Bivonoid operculum, which is quite distinct, belongs to it, it is here kept provisionally separate. It is of smaller growth, and yet of much coarser sculpture ; with a different shade of colour, which in this family appears to be of some importance. *Long.* ·5, *diam. apert.* ·05.

Hab.—Mazatlan ; very rare, on Spondyli &c ; *L'pool Col.*

Tablet 1494 contains 3 specimens.

356 PBIVONIA ALBIDA, *n. s.*

B. t. parvâ, albidâ ; anfr. ii. *primis lævibus, turbinoideis, subelevatis, postea amplectatis ; anfr. normalibus subregulariter spiraliter contortis, marginibus subparallelis, ad sese plerumque, ad concham alienam parum, adhærentibus ; rugis concentricis plus minusve expressis, spiralibus nullis.*

Both sculpture, colour and size mark this species as distinct, although only 2 extremely young specimens and one with about 5 normal whirls were found. This measures *long.* ·22, *lat.* ·1, *diam. apert.* ·03.

Hab.—Mazatlan : extremely rare, off Spondylus ; *L'pool Col.*

Tablet 1495 contains a young and the adult specimen.

357. PBIVONIA ———, *sp. ind. (a.)*

Tablet 1496 contains 2 minute Spirorbiform specimens, and a portion of a separate non-spiral tube, only ·02 in diameter, which do not appear to be the young of any of the former species. They are of a pale colour, and are nearly smooth.

Tablet 1497 contains a sp. ·08 across, on Pisania insignis, containing 4 regular sinistral whirls, like Planorbis spirorbis. It is smooth, and may be the same species as the above, the diameter being about the same; but the colour is much deeper.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

358. ?? BIVONIA ————, *sp. ind. (b.)*

Tablet 1498 contains a scarcely spiral white shell wandering like an Annelid over a Byssoarca solida. The texture however appears Molluscan. It has two very stout rounded keels on the back. The same sp. displays the attached valve of Hipponyx serratus.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

GENUS PETALOCONCHUS, *Lea.*

Animal ignotum.

Testa extus "Bivoniæ" simillima; intus, transversim rarissimè septata; anfractibus medianis, laminis elongatis spiralibus variè dispositis, cameram sæpé pæne secantibus; plerumque duabus majoribus, tertiâ, quasi plicâ columellari, minore.

Operculum [*specierum duarum*] *parvum, tenuissimum, corneum, lævo, subplanatum, vix spirale.*

H. C. Lea, Trans. Am. Phil. Soc. 1843, vol. ix. p. 229.—*Woodw. Man. Moll.* pt. 3, p. 462.—*Monogr.* in *Proc. Zool. Soc.* July, 1856.

The remarkable internal structure in many species of Vermetidæ, appears to have been overlooked by English naturalists, although it was observed many years ago by Lea in a fossil species. Three species in my collection from different seas having presented clear difference of external structure, I had proposed for them the name of Macrophragma, which is now retained for the typical, though small, Mazatlan species. Mr. Cuming having most obligingly allowed me to open several of his specimens, nine species have been found, which are described in the Proc. Zool. Soc. They cannot be distinguished externally from Bivonia, which even as species they most closely resemble. The shell has somewhat the same relation to Vermetus that Nerinæa has to Cerithium.

359. PETALOCONCHUS MACROPHRAGMA, *n. s.*

P. t. parvâ, dextrali, dense purpureo-fuscâ; cylindraceâ, solutè spirali, marginibus spiræ sæpe subparallelis; plerumque glomerante, interdum solitariâ; basi ad conchas, seu alterâ ad alteram, constrictè adhærente, sæpe erodente; superficie rugis irregularibus spiralibus haud extantibus, et rugulis incrementi ornatâ: intus anfr. primis, et ultimis quoad IV., *apertis; medianis laminatis; laminâ superiore multo majore, prius conspicuâ, à columellâ extante; primum simplici, dein angulo recto reflexâ, extus carinis* i-iii. *quarum* ii. *acutissimis; laminâ inferiore simplici, à columellâ extante, altero juxta carinam fere attingente; laminâ tertiâ minimâ, intercalante, inferiori pæne attingente; laminis tenuissimis, albis, diaphanis, lineis incrementi conspicuis; paginâ internâ maximè nitente, transversim haud septato.*

The shell is of small diameter; when growing freely taking a tolerably regular spiral, like a Turritella squeezed sideways; the whirls enlarging very slowly, and resembling a winding staircase. It is known when fresh by its lustrous purple-brown colour and absence of pits on the surface. It occasionally eats into the shell on which it grows, like Spiroglyphus, from which it is known by being dextral and cylindrical. Sometimes it clusters in large masses, like Bivonia glomerata. At which whirl the internal laminæ commence, it is difficult to say; they have been counted running through 10 whirls; and the terminal number of open whirls appears to vary. At each end they commence (the large upper one first) as simple columellar plaits, afterwards increasing till they fill the greater part of the cavity and nearly meet. The upper one bends at right angles, with two sharp keels at the corners, and a third, not always developed on the upper side. The lower one goes to meet it, forming with it and the columella a rectangle, only communicating with the remainder by a narrow slit. A small columellar plait supports the inside base of the lower lamina. The delicate texture of these laminæ resembles the cup in Crucibulum, &c. No transverse partitions have been seen. A solitary specimen on the base of a Uvanilla unguis has at least 13 whirls, and measures *long.* ·65, *lat.* ·13, *div.* 6°. A large sp. measures *lat.* ·23, *diam. apert.* ·07.

Hab.—Mazatlan; not uncommon, on Uvanilla, Cuma, Murex princeps, &c.; *L'pool & Havre Coll.*—Panama; on Margaritiphora; Mus. Cuming.

Tablet 1499 contains 6 sp. broken so as to shew the internal laminæ.—1500, a mass almost covering Murex princeps, with a ?Sphænia in a varical foliation.—1501, Uvanilla olivacea, with several specimens attached.—1502, 2 sp. of U. unguis, do.—1503, Leucozonia cingulata, do.—1504, 3 sp. Cuma costata, do.: in one, the P. macrophragma has been removed, shewing the amount of erosion.—1505, Rhizocheilus nux, Pisania gemmata, and Columbella fusca, do.—1506, Omphalius ligulatus and Fissurella rugosa, do.

Opercula of Vermetidæ.

(a.) Operculum o. "Aletæ centiquadræ" simile, sed magis regulariter multispirale; extus parum concavum, marginibus anfractuum lævibus, parum extantibus, umbone centrali elevatâ; superficie anfr. circiter viii., *umbone* iv. *instructis; intus cicatrice magnâ irregulariter concentricè rugosâ.*

Tablet 1507 contains one of three opercula, probably belonging to a second species of Aletes.

(b.) Operculum spirale, corneum, subolivaceum, tenue; extus parum concavum, marginibus valde tenuibus, haud regularibus; anfr. circiter [xv. *haud distinctè definitis, haud extantibus, ad apicem haud umbonatum ascendentibus; intus cicatrice parvo, vix corrugato.*

Tablet 1508 contains two opercula, which probably belong to an Aletes.

(c.) Operculum haud parvum, haud regulare, corneum, tenue, diaphanum; extus subconcavum, laminis parum elevatis, umbone extante: intus vix convexum, liris ?concentricis multis subdistantibus, subextantibus, margine parvo; cicatrice parvâ, irregulariter concentricè rugosâ.

Tablet 1509 contains an operculum, in poor condition, intermediate between Aletes and Vermetus proper; remarkable for the internal ridges, which are not crowded into the middle portion, and leave a comparatively small margin.

(d.) Operculum distinctè spirale, tenue, corneum, diaphanum; extus marginibus parum convexis; laminâ concavâ solutâ, lævi, acutâ, spiraliter ascendente, anfr. internis conveniente, apice parum elevato, vix umbonato: intus parum convexum, triente internâ anfr. multis; trientibus duabus externis anfractu ultimo occupatis; cicatrice vix corrugatâ.

The outside presents the appearance of a set of saucers, but is more distinctly spiral even than in Aletes. When viewed inside by transmitted light, the size of the last whirl is not seen, owing to the intercalation of the external ridges.

Tablet 1510 contains the only specimen found.

(e.) Operculum minimum, corneum, tenue, flavidum, diaphanum; extus marginibus convexis, laminis concavis solute axim extantem concentricè, subspiraliter ascendentibus, haud foliaceis, subcrenulatis; intus marginem versus convexum; cicatrice parvâ, circulari, lirulis extantibus concentricis circiter xii.

One imperfect specimen alone was found. It most resembled Vermetus proper. The ridges appeared principally concentric, but here and there running into each other, as though spirally. The tiny saucers were piled on each other outside, so that the external outline was convex. After repeated examinations, it sprang from the forceps, and was lost in the meshes of the carpet.

Tablet 1511 contains a skotch.

(f.) Operculum tenue, rubro-aurantium, haud regulare; extus (plerumque dense incrustatâ) concavum, maxime intus umbonem, marginibus concentricis irregulariter vix extantibus; intus lineis concentricis pluribus vix conspicuis; umbone latiore, valde extante; margine lato, corneo, plus minusve convexo; musc. cicatr. circulari, partem interiorem occupante.

Six opercula were found, probably belonging to Bivonia contorta, whose reddish orange colour is conspicuous against the very thick corallinous incrustations which generally cover the outer part. The growth is irregular, but slightly concave externally, except inside the boss where it is very deep. The margin is also irregular, and of a light horn colour. It closely resembles the operculum of Bivonia glomerata, *Phil.*, which is generally similarly incrusted.

Tablet 1512 contains 2 opercula, shewing variations in growth, with the thick incrustation removed from one of them.

(g.) Operculum solidius, dense rufo-purpureum; extus convexum, marginibus foliaceis tenuibus, angulo fere rectò extantibus: intus concavum; margine haud interrupto, valde rotundato, convexo, angustiore, diaphanâ; cicatr. musc. haud conspicuè definitâ, lirulis concentricis viii. *conspicuis; umbone maximo extante, subspirali.*

This operculum within looks like a purple basin with a thin, narrow, transparent rounded edge, and a stout boss rising up in the middle. The outside, which was much incrusted, has the layers rising sharply from the surface up the spire. The concentric lirulæ are distinctly marked within (except on the boss) with a conspicuous termination, but the margin shews no break. The colour near the boss is extremely deep. It is clearly congeneric but not conspecific with the last.

Tablet 1513 contains the only specimen found.

Family CÆCIDÆ.

These creatures, ranked by *Fleming* among the Foraminifera, by *Philippi* (à primâ manu) among the Pteropods, and afterwards, along with the Vermetidæ between Eulima and Siphonaria, are arranged by *Gray* between Rissoa and Melania. Their natural allocation however appears to be between Vermetus and Turritella, as assigned by *Forbes & Hanley (Br. Moll.* iii. 176) and by *Clark (Moll. Test. Mar. Brit.* p. 322.) They yet seem sufficiently distinct both in animal and shell, to be separated, as a family, from each of their congeners.

Genus CÆCUM, *Flem.*

Cœcum, *Flem.* 1824, *Edinb. Encycl.* vol. vii. p. 67, et auct.
Brochus + ?Cornuoides, *Brown*, 1827, *Conch. Gr. Br.* pp. 124, 125.
Odontina, *Zborzewski*, 1834, *Mém. Soc. Mosc.* iii. p. 310.
Odontidium, *Phil.* 1836, *Enum, Moll. Sic.* vol. i. p. 102.
Cæcalium, *Macgil.* 1843, *Moll. Aberd.*
Cæcum, *Phil. Handb. Conch.* p. 197:—*H. & A. Ad. Gen.* i. 355:—*Clark.* loc. cit.
Dentaliopsis, *Clark*, ms. 1834.
Corniculina, *Munster.*
Odontostoma, *Cantr.* non *Phil.*

For a full account of the animals of the British species, v. *Clark* loc. cit. to whose patient researches, long hidden from the world, is due the first clearing of the mystery attending these curious little shells. The animal of the N. England species, C. pulchellum, has also been described by *Stimpson, Proc. Bost. Soc. N. H.* Oct. 1851. With regard to the shells, errors have arisen from supposing that the adult form generally seen immediately follows the spiral part known to be the early stage of C. glabrum, and therefore believed to be characteristic

of the genus.* Clark however speaks of three or four epochs of growth in C. trachea, and Stimpson of two (with one intermediate) in C. pulchellum. The large number of specimens that were fortunately disentombed from the worm-eaten galleries of Spondyli and the crevices of Chamæ and Ostreæ, lead to the conclusion that some species at least form many successive portions; so that if the whole shell could remain entire, an object would be seen resembling an incurved Toxoceras, with a Skeneoid apex. Among the 700 Mazatlan Cæca of various ages, only one specimen with the spiral portion was found; and not one of the spire alone. (The minute Vitrinellæ are perfectly distinct.) They are probably so frail as rapidly to perish. After repeated examinations of large numbers of individuals, it is more easy to say what does not, than what does hold good as a specific character. The shell, at different periods of its growth, assumes very variable proportions of length and breadth, larger or smaller arcs of circles with changeable radii, different forms of mouth, greater or less protrusion of apical plug, and perhaps opposite styles of sculpture. The different conditions are proved to belong to the same species by our continually finding shells with the anterior and posterior portions belonging to different types. Shells in this state were described by Prof. Adams as C. monstrosum, and must have been very puzzling to an author who in so variable a genus described 5 out of 8 species from 8 specimens. The number and disposition of the rings, on which several species are founded, is a very variable character. Perhaps the most constant is the form (not the amount of protrusion) of the apical plug; which Prof. Adams, with less than his usual minuteness of description, unfortunately passed over, although Searles Wood in his Crag Mollusca had called attention to its importance. A careful examination however of the types of 6 out of the 8 species described from Panama, which are fortunately preserved in the Cumingian collection, has supplied the deficient information. It seems ungracious, while now describing 16 new species from Mazatlan, (the opercula being known in nine) to group together 5 out of the 8 already described from the same coast. I have only done so, because the necessities of the shells seemed to require it; and it would have been easy, on the principles followed by Prof. Adams, to have increased the number of Mazatlan species four-fold. The plan here adopted

* . . . "septum, marking the point at which the original spire has been cast off." *Forbes & Hanl.* loc. cit. p. 176.

was to take first those species (C. undatum and G. lævc) of which there were the greatest number of specimens presenting well marked characters; to ascertain the mode of growth and power of variation in these; then to apply principles so arrived at to the elucidation of the rarer forms.

To save labour in the identification of species, they are here grouped under 3 sections, according to form and sculpture. The plug also is described as either (1) mammillate, when it is uniformly convex, without apex, as in C. glabrum; (2) ungulate, when the whole surface gradually rises towards the back, where it ends in a long but narrow apex, as in C. trachea, presenting in profile the appearance of a hoof projecting from the ankle of the shell; or (3) mucronate, when it is nearly flat over the principal part of the surface, rising suddenly into a knob at the back. The projecting profile is described as "margo lateralis."

The largest and finest shells belong to the group Elephantulum; this is however scarce in individuals, and the typical condition of the genus appears to be in the Anellum group.* Their relative proportion of individuals and species, as found in the Mazatlan collection, may be thus summed up.

Elephantulum	5 species,	71 individuals.
Anellum	6 „	412 „
Fartulum	7 „	210 „
Total	18 „	693+ „

Section A. Elephantulum.

C. t. majore, tereti, solidiore, æqualiter arcuatâ, aperturâ vix contractâ, postea expansâ, parum declivi, adultâ longitudinaliter sulcatâ, testâ juniore haud subiter mutante.

The shells thus grouped are like minute Dentalia Elephantina. They differ from the more common forms in their greater size and proportionate length, and in the regularity of the outline, both when young and adult. They appear to be rare, both at Mazatlan and in other seas. Very few young specimens were found. From the appearance of the youngest, it is probable that these, like the annulate species, are smooth in the earliest stages. The number of ribs appears to be a very

* Of a fourth group, Inflatulum, only one species is yet known, recent in sponge, fossil at Grignon

inconstant character, as in Siphonaria. The habit of growth also is very similar in all. Prof. Adams only found two specimens belonging to this group, which he called C. laqueatum; the fortunate circumstance of one being in the Cumingian collection enables us to complete the imperfect description in *Pan. Shells*, no. 215, pp. 162, 311. The plug is found to be of unique formation, being mammillate over the principal surface, with a separate rather prominent lateral tubercle, which is somewhat s nistral.

360. CÆCUM INSCULPTUM, *n. s.*

C. (Elephantulum) t. juniore vitreâ, diaphanâ, adultâ solidâ; liris validis quadratis et interstitiis profundis ornatâ; aperturam versus haud tumente; septo ungulato, subprominente, apice obtuso, paululum dextrorsum verso, margine laterali subrecto; operculo ?....

Only one young and one adult specimen, besides fragments, were found of this species. The young shell is as transparent as glass, and of exquisite beauty. The adult is solid, bearing deeply cut sculpture. It is known from C. liratocinctum, by the absence of rings, the squareness of the ribs and depth of the interstices; and by the plug which is somewhat intermediate between the ungulate and mucronate forms, rising in a nearly straight and regular line to an obtuse apex which is turned somewhat to the side in both specimens. The youngest measures *long.* ·053, *lat.* ·013,—·017.
The largest " ·133, " ·023—·028.

Hab.—Mazatlan; extremely rare, off Spondylus, *L'pool Col.*

Tablet 1514 contains the perfect specimens, old and young.

361. CÆCUM SUBSPIRALE, *n. s.*

C. (Elephantulum) t. maxime elongatâ, tenuissimè liratâ; juxta aperturam annulo subtumente; septo mucronato, superficie subplanato, mucrone laterali, dextrorsum sitâ, parvâ, apice rotundato, subspirali: operculo concavo, tenui, anfr. plurimis lirâ tenui spiraliter ascendente.

Of this beautiful species, a giant among the Cæca, being no less than a tenth and a half of an inch in length, 6 perfect and 6 broken sp. were found. It is known by the finely striated and

slowly enlarging shell; and by the plug, which is nearly flat, with a very small knob on the right side of the back. This, under a high power, appears to be of a subspiral growth, like a tiny Vitrinella fixed on the surface. The operculum appears to be thinner than that of C. liratocinctum, with rather more numerous whirls and a finer spiral ridge. It is known at once from the dextral specimens of that species by the very fine ribs being straight, never spiral, and by the apex being round, not pointed.

The youngest specimen measures *long.* ·05, *lat.* ·007—·01.
The largest „ „ „ ·155, „ ·025—·03.

Hab.—Mazatlan; off Spondylus; extremely rare; *L'pool Col.*

Tablet 1515 contains 2 very young specimens, the largest adult, and a fragment retaining its operculum.

362. Cæcum abnormale, *n. s.*

C. (Elephantulum) t. (?abnormaliter) curtissimâ, arcuatâ, latiore, tenuiore; lirulis tenuissimis circiter xxx. *ornatâ, aperturam varicosam tumentem supereuntibus; interstitiis interdum minutissimè concentricè striatis; septo mucronato, prominente; mucrone omnino dextrorsum lateraliter sito, obtusiore; margine laterali (i. e. hoc specie, dorsali) concavo, rapidè ascendente; operculo ?....*

Whether this be an extremely short deformed variety of C. subspirale, or a very aberrant species, cannot be affirmed until more specimens are found. It is common among Cæca, in the process of growth, for specimens of the same age to vary greatly in length; but these shells, as shewn by the stout varix at the mouth, are mature; and yet, contrary to the habit of Elephantulum, they are much shorter in proportion even than in the compact group Inflatulum. They are so much bent that notwithstanding their shortness, both the surface of the plug and the interior of the mouth can be inspected without altering the position of the shell. Another very singular feature is the position of the plug, which is set on the extreme right, so that the front (or back) view of the shell gives its profile. One specimen measures *long.* ·06, *lat.* ·023; the other, *long.* ·048, *lat.* ·018.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1516 contains one specimen.

363. CÆCUM OBTUSUM, *n. s.*

C. (Elephantulum) t. elongatâ, tenue liratâ, aperturam versus haud tumente, ; septo submammillato, parum tumente, apice obtusissimo dorsum versus spectante ; operculo ?....

Six specimens and fragments were found of this species, which in the liration closely resembles C. liratocinctum, but appears quite destitute of rings. It is known however by the plug, which is almost mammillated, but has a very obtuse apex pointing towards the back. The smallest of the specimens measures · *long.* ·04, *lat.* ·01 —·014.
The largest · „ ·132, „ ·017—·026.

Hab.—Mazatlan ; extremely rare, off Spondylus ; *L'pool Col.*

Tablet 1517 contains the largest and the smallest specimens.

364. CÆCUM LIRATOCINCTUM, *n. s.*

C. (Elephantulum) t. tenue liratâ, liris plus minusve acutis, confertis seu subdistantibus ; plerumque huc et illuc, maxime aperturam versus, annulis incrementi obsoletis cinctâ, sub liris monstrantibus ; albidâ, seu albâ et cornеâ concentricè undato-nebulosâ ; septo submucronato, subungulato ; mucrone dactyliformi ; apice plerumque maximè prominente, laterali, acuto ; margine laterali subconcaviter ascendente : operculo valde concavo, anfr. circiter xii. *lirâ prominente spirali, marginem interdum quasi duplicante.*

This very variable species shews a tendency both in its young and old stages, sometimes very much, sometimes scarcely developed, to form rings of growth under the ribs, which cross them like the varices of Scalaria. The ribs are sometimes fine and close, sometimes strong and rather distant, sometimes degenerating into mere angles. A few very fresh specimens were found, with white and horny brown beautifully mottled in concentric portions. The whirls of the operculum are furnished outside with a very strong rib, which makes the margin sometimes appear double. The plug is generally extremely prominent at the side, flattened anteriorly, and rising into a finger-like pointed knob behind. Sometimes however the whole surface rises, and the apex becomes rather more central. Rarely in very young shells (when it is extremely sharp) it is rather sinistral ; but as the ribs then take a somewhat spiral line down the tube, it is presumed to be merely accidental. Only imperfect specimens of this form have yet been seen from

other seas; these, from the sponge of commerce, and from the Isle of France (Bean) appear distinct; those from "Singapore" (among Chamæ and Plicatulæ, P. P. C.) offer no grounds of specific separation. I have not however ventured to insert them in the habitat, as a larger series of perfect shells may shew distinctive characters. From Mazatlan traces were found (including varieties) of 51 specimens, of which about 20 were perfect, and 4 possessed their opercula.

The smallest measures	*long.* ·047,	*lat.* ·017.
The longest ,,	,, ·145,	,, ·015—·025.
The largest ,,	,, ·14,	,, ·02 —·032.

Hab.—Mazatlan; very rare, off Chamæ, Spondyli, &c.; *L'pool Col.*

Tablet 1518 contains 7 specimens varying in age and sculpture, with a fragment having C. firmatum interwedged.—1519, 1 fresh sp. with operculum; ribs close and deeply chiseled.

Var. TENUILIRATUM; *t. liris crebris, tenuibus*; *apice parum prominenti.* Tablet 1520 contains 1 specimen.

Var. SUBOBSOLETUM; *t. albâ, alabastro simili; liris paucis interdum vix monstrantibus.* Tablet 1521 contains a young and an adult specimen.

Var. SUBCONICUM; *t. septo maxime elevato, subconico.* Tablet 1522 contains a perfect, and a worn specimen. The latter appears to have its apex subcentral, and may be distinct. The value of the several distinctions above named cannot be tested till more specimens are procured.

Among all the specimens of Mazatlan Cæca, only one was found with its spiral apex. It was so extremely frail that (not however until after careful observation) it dropped off on touching with a camel hair pencil. This portion possessed two whirls, of somewhat irregular flattened growth, differing in texture from Vitrinella, and much smaller, measuring only ·006 by ·004. About half a whirl however remained on the shell, separated from the normal part by a very distinct suture. On removing this, it was found that no plug had yet been formed. The species is therefore indeterminate, as the shell is in the main smooth, with extremely faint traces both of concentric and longitudinal sculpture. It is placed provisionally under C. liratocinctum. The normal part measures *long.* ·028, *lat.* ·0045—·009.

Tablet 1523 contains the specimen.

365. CÆCUM HEPTAGONUM, *n. s.*

C. (Elephantulum) t. septangulatâ, angulis valde prominentibus; annulis rotundatis confertis cinctâ, angulos longitudinales supracurrentibus; aperturâ planatâ, extus heptagonis formâ, intus circulari, sulco concentrico ornatâ; operculo ?....

Although only a fragment was found, containing a perfect mouth, the shell is so different from all other known species of the genus, that it was thought best to name it and thus direct attention to its existence. By its strong longitudinal angles, it would rank with Elephantulum; by its concentric rings, (traversing these angles) with Anellum. The front view of the aperture exactly resembles an old-fashioned clock-face in miniature. In a flat surface with a heptagonal border is cut a circular hole surrounded by a ring. The discovery of this curious link, which was on the point of being discarded, shews the importance of not rejecting fragments. The diameter of the mouth is *ext.* ·02, *int.* ·015.

Hab.—Mazatlan; 1 imperfect sp. off Spondylus; *L'pool Col.*

Tablet 1524 contains the fragment.

SECTION B. ANELLUM.

C. t. rare elongatâ, juxta aperturam parum constrictâ, annulis concentricis testâ adultâ cinctâ.

366. CÆCUM ELONGATUM, *n. s.*

C. (Anellum) t. elongatâ, tereti; primum lævi, dein annulis rotundatis, parum extantibus instructâ, interstitiis minimis; septo ungulato, apice parum elevato, subobtuso, margine laterali subrecto; operculo ?....

? Var. SEMILÆVE; *t. huc et illuc annulatâ, huc et illuc lævi.*

Known from C. firmatum by the elongated form, and by the scarcely raised rounded rings with very small interstices; also by the plug, which is ungulate, with the apex not dextral and rather broad. Of the ?variety, three specimens were found, not perfect enough for description, but most probably distinct. They seem to have relations with C. liratocinctum, but shew no trace of longitudinal ribs. One fragment presents a few well marked rings between smooth spaces. Another very large but rubbed specimen has a sudden contraction followed by a

very large swelling previous to the aperture. It measures *long.* ·112, *lat.* (juxta aperturam) ·025—·028.

Of the typical form about a dozen sp. were found, but most of them were rubbed. They present however the different stages of growth. The youngest measures *long.* ·06, *lat.* ·008—·017.

The largest „ „ ·103 „ ·015—·023.

A fragment (? conspecific) „ „ ·027.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 1525 contains 4 sp. and fragment of different ages, typical form.

Tablet 1526 contains 2 sp. *?var.* semilæve.

367. CÆCUM SUBIMPRESSUM, *n. s.*

C. (Anellum) t. elongatâ, haud parvâ, solidiore; annulis creberrimis, rotundatis, haud extantibus, interstitiis parvis, sæpius subimpressis; septo mucronato; margine laterali vix concavo; mucrone parvâ, obtusâ, ad dorsum sitâ; operculo ? concavo.

Of this species only 2 adult and 6 young specimens were found; these, being in different stages, have to be retained. The sculpture and habit of growth resemble those of C. elongatum; from which it differs especially in the narrow mucro. The only specimen possessing the operculum is of aberrant growth. The sutures are least impressed in the very earliest stages. The smallest sp. measures *long.* ·058, *lat.* ·008—·016.

The largest „ „ ·115, „ ·017—·03.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 1527 contains 7 specimens in different stages of growth, of which one possesses the operculum, and another is curiously deformed.

368. CÆCUM FIRMATUM, *C. B. Ad. (diagn. auct.)*

C. (Anellum) t. robustâ, arcuatâ, satis tereti; aperturâ vix constrictâ; t. juniore primum lævi; dein annulis circiter XXIII. — XXXIII., *primum acutioribus, dein parum quadratis; interstitiis subquadratis, plus minusve distantibus, interdum aperturam versus evanidis; septo subungulato; apice parum prominente, subdextrorsum sito, obtusiore, latiore; margine ad latus subrecto; operculo ?....*

Cœcum firmatum, *C. B. Ad. Pan. Shells*, no. 213, pp. 161, 311.
+ Cœcum eburneum, *C. B. Ad.* do. no. 212, pp. 161, 311.
+ (adolesc.) Cœcum monstrosum, *C. B. Ad.* do. no. 216, pp. 162, 311.
+ (adolesc.) Cœcum pygmæum, *C. B. Ad.* do. no. 218, pp. 163, 311.
P + (jun.) Cœcum diminutum, *C. B. Ad.* do. no. 211, pp. 161, 310.

The fortunate preservation of specimens in the Cumingian collection, received from Prof. Adams himself, (viz. 3 of C. firmatum out of 85, 3 of C. eburneum out of 22, 2 of C. monstrosum out of 7, and 1 of two of C. pygmæum) which, through the wonted kindness of H. Cuming, Esq., I have been enabled to subject to a rigid microscopical examination and comparison with the Mazatlan specimens, enables me to give the above synonymy with tolerable confidence, in spite of the worn state of most of the shells. Of C. diminutum, Prof. Adams only found one specimen. As far as can be judged from the description, it is the early stage, long and slender. The next stage, appears to be C. pygmæum. C. monstrosum partakes half of this, and half of the adult form. A similar state is found in other species, when there is any quantity of specimens. C. eburneum and C. firmatum are to one another as the English forms C. imperforatum and trachea. The rings in the Cumingian specimens of C. eburneum vary from 26—33, and are more or less pressed together near the aperture. This character is extremely variable. The largest specimen here given is exactly intermediate between the two forms. It appears very rare at Mazatlan, where it is represented by C. undatum.

C. firmatum is distinguished from nearly allied species by the following characters. Ribs somewhat flattened and squared, with deep rather squared interstices. Plug intermediate between the ungulate and mucronate forms; rising gradually in a nearly straight line to the summit, which is placed rather to the right, somewhat broad but thin, with the apex rounded. The youngest shell (probably belonging to this species, but the plug is rather imperfect) is quite smooth in the first part, but afterwards ringed; it measures *long.* ·067, *lat.* ·006—·012. The next shell, measuring *long.* ·048, *lat.* ·008—·013, is gracefully bent and tapering, and entirely ringed. The next, in the 'pygmæum' state, measures *long.* ·063, *lat.* ·013—·017. The rings on first appearing are rather sharp and distant: they gradually assume the normal type; sometimes however running into each other, in the 'eburneum' state. The largest specimen measures *long.* ·1, *lat.* ·016—·025.

Hab.—Panama; common in the sand; *C. B. Adams.*—Mazatlan; 14 sp. off Spondylus &c.; *L'pool Col.*

Tablet 1526 contains 5 specimens in different states.

369. CÆCUM CLATHRATUM, *n. s.*

C. (Anellum) t. haud parvâ, solidiore, annulis valde distantibus, acutioribus, validis, extantibus, cinctâ; interstitiis concavis; septo subplanato, mucronato; in adultâ margine laterali haud monstrante; mucrone minimâ, obtusâ, pæne in dorsum sitâ; operculo ?. . . .

This extremely elegant species is remarkable for its size; very distant bar-like rings, which are rather sharp; gracefully curved interspaces; and nearly flat plug with a scarcely prominent obtuse mucro, scarcely (if at all) inclined to the right. Only 12 specimens were found. The youngest sp. measures *long.* ·057, *lat.* ·007—·017. The largest, *long.* ·102, *lat.* (interstices) ·026, (outside) ·03.

Hab.—Mazatlan; off Spondylus, extremely rare; *L'pool Col.*

Tablet 1528 contains 4 specimens of different ages.

370. CÆCUM QUADRATUM, *n. s.*

C. (Anellum) t. parvâ, curtâ, solidâ, annulis quadratis XII.—XX. *cinctâ; interstitiis profundis, quadratis; aperturâ subcontractâ, annulis concurrentibus; septo mucronato, margine laterali concavo, mucrone parvâ, extante, angustâ, subdextrorsum sitâ: operculo valde concavo, anfr. circiter* X. *lineâ spirali expressâ.*

? Var. COMPACTUM, *t. interstitiis parvis seu evanidis, annulis maxime planatis.*

The extreme forms of this shell are singularly different; at one end of the scale being a larger shell, muricated with squarish distant rings, passing into C. clathratum; at the other, a small stunted state in which the rings have so run together that the interstices appear like simple grooves, and the shell approaches the young of C. subimpressum. Among 43 specimens found, however, (of which 3 possessed opercula,) there appeared too gradual a transition to allow of their separation. At the same time the habit of growth appears quite distinct from that of any of the neighbouring species. It is customary for Anella to make their rings compact in the mature

state; but some specimens shew that in this species they are often compact in the very young state, and become looser afterwards. The variety 'compactum', though smaller than the typical condition, may be a dwarfed form. The species is known by the great prominence and squareness of the ribs and interstices; the compact growth; and the plug, which is nearly flat over the surface, gradually rising in a curve to the little finger-shaped mucro, which is blunt at the top, short, and placed somewhat to the right. An extraordinarily large sp. measures *long.* ·072, *lat.* (interstices) ·016, (outside) ·02.

Hab.—Mazatlan; rare, in Spondylus and Chama; *L'pool Col.*

Tablet 1529 contains 7 specimens, typical form, in different conditions of growth, one of which has the operculum in situ.—1530, 7 do. var. compactum, and intermediate forms. The youngest specimen is somewhat doubtfully affiliated.

371. Cæcum undatum, *?n. s.*

C. (Anellum) t. juniore exili, gracile tereti, plus minusve arcuatâ, lævi, nitidâ, aperturâ haud declivi; testâ adultâ curtâ, obesâ; extremitatibus ad angulum circ. 115° *alterâ ad alteram truncatis, utrinque contractis, vix annulatis; aliter, superficie eleganter undatâ, annulis (numero variantibus* x.—xv.*) acutis, plus minusve extantibus, interdum vix monstrantibus; interstitiis concavis, lævibus; aperturâ primum contractâ, deinde paululum reflexâ, acutâ; septo typicè ungulato; lateraliter marginibus rectis, triangulum scalenum formantibus, apice laterali, acuto, prominente; ad frontem regulariter excurvato, tumente. Operculo extus concavo, multispirali, anfr. circiter* xv. *suturâ distinctâ, margine simplici.*

Adolesc. ? = C. parvum, *C. B. Ad. Pan. Shells,* pp. 163, 311: "*t. arcuatâ, gracili, vix tereti; albidâ; annulis* xv. *acutis, distantibus, haud multum elevatis: apice laterali, prominente. Long.* ·065, *lat.* ·019." Sp. un.

The description of C. B. Adams' unique specimen being imperfect, I did not feel at liberty to affiliate the very numerous series of Mazatlan shells, merely because the ribs were sharp, to a species whose name is applicable to the whole genus. The specimen is however most likely the adolescent state of this species, after the waved rings have been formed, but before the final contractions. The young state of this shell cannot be distinguished from that of the next species. It is long, slender

and smooth, with the mouth at right angles. The successive portions are not formed by uniform progression; but often a very sudden turn is seen in the arcuation, or rapid thickening of the body. The most singular state is when the thick annular part is just beginning. Then at the end of a smooth slender tube we have a bowl with three or four rings outside suddenly rising at a marked angle, not unlike a short tobacco pipe. The rings are often nearly evanescent, when the shell can hardly be distinguished from the next species. It is found of very variable lengths in its growing state; perhaps from the decadent portion not always falling off immediately after the new part is formed.* The greater or less prominence of the plug appears due to the same cause. The sharply triangular outline of its profile is characteristic of this and the next species. The shell in its adolescent state would appear to stand at a considerable angle to the plane of the animal's foot: but when adult, it is well fitted to make its way along the narrow worm-eaten galleries in which it is generally found. The mouth is then so slanting that the two truncations of the cylinder form an angle of about 115° to each other. This is contracted at each extremity; the contracted part not being waved. The mouth, after being very much narrowed, makes a slight sharp expansion all round, like the neck of a jar. The texture of the shell is sometimes like alabaster, sometimes slightly waxen, perhaps from the epidermis. This appears to be the common species at Mazatlan, as C. firmatum is at Panama, about 320 specimens altogether having been found: of these 37 fortunately possessed the operculum. This tiny body, which in an adult shell is only ·013 across, nearly filling the constricted aperture, is very concave externally, with a central nucleus and about 15 whirls, which are for the most part strongly marked, with an entire margin. The youngest among the specimens which were found perfect measures *long.* ·042, *lat.* ·01.

A sp. (form monstrosum)	„	„ ·067,	„ ·01—·02.
An adult	„	„ ·074,	„ ·021.

* The very complex nature of the plug in all the Cæca, apparently formed by successive layers like ordinary shell, and not of uniform material like the septa in Turritella, Vermetus, &c., taken in conjunction with the variable length of specimens apparently of the same age, leads to the conjecture that the same plug may be carried onwards during the life of the animal; that after making a fresh length, it loosens the plug, (adding to its margin,) and fixes it in its new locality. Perhaps at the same time it disengages the old portion; as the edges are always regular, differing from Melaniæ, Truncatellæ, &c. which rot off of themselves, and the shell is never found with the disused portion adhering. A second Clark, keeping a Vivarium of Cæca in an old Spondylus, might reveal charming anecdotes of the habits of these creatures!

Hab.—Mazatlan; abundant on Spondylus, not uncommon on Chama, Modiola capax, &c., rare on Ostrea iridescens; *L'pool & Havre Coll.*—? Panama, 1 sp., *C. B. Adams.*

Tablet 1531 contains 4 sp. smooth state.—1532, 11 do. partly smooth, partly waved.—1533, 4 do. waved state adolescent.—1534, 7 do. adult.—1535, 2 sp. jun. and 2 adult, with operculà.

Tablet 1536 contains 4 sp. deformed growth, and 1 pierced by a tiny proboscidean.—1537, 1 sp. plug extremely prominent; 1 do. with the profile line very slightly arcuated; 1 do. deformed.

Tablet 1538 contains 3 sp. probably belonging to this species, but closely approaching C. læve.

Section C. Fartulum.

C. t. lævi, cylindraceâ, sæpius utrinque contractâ; aperturâ sæpe declivi.

This group is named from the general resemblance in form to a little sausage. Some species however approach the long tapering Elephantulum, while others are approached by the ringed Anellum.

372. Cæcum læve, *C. B. Ad. (diagn. auct.)*

C. (Fartulum) t. juniore "C. undato" exactè simulante; t. adultâ eidem simili, sed lævi, nitidâ, haud undatâ, interdum ante aperturam plus minusve tumidiore; aperturâ et apice minus contractâ; operculo concavo, suturis minus distinctis, texturâ semicorneâ, brunneo tinctâ.

C. B. Ad. Pan. Shells, pp. 162, 311, no. 214.

This shell, imperfectly described by Prof. Adams from two specimens varying in age, is so remarkably like C. undatum not only in its general habit but in several minute particulars, and especially in the shape of the plug and mouth, that aberrant individuals of each are very difficult to distinguish. I know of no character by which the young shells can be separated. When it arrives at the "monstrosum" stage, the absence of undulated rings in the bowl of the pipe becomes a marked and uniform character. In the adult, the cylinder is rather less contracted at the two ends, and the aperture a trifle less slanting. Before the contraction of the aperture, the tube is sometimes swollen, which has never been observed

in C. undatum. About 170 specimens were found (of which at least 44 possessed their opercula) agreeing in the above distinctive characters. The texture of the shells, when fresh, is not alike in the two forms; C. undatum being of a somewhat waxen white, or alabaster: C. læve being of a more horny colour, occasionally developing a marked brown, especially within, where it frequently leads to delusive hopes of finding the operculum. This is of the same size and concavity as in C. undatum; but in the specimen examined within does not possess the sutural line, and the whirls are apparently fewer. The smallest specimen measures *long.* ·035, *lat.* ·005—·01.
An unusually large one „ ·07 „ ·018.

Hab.—Panama; extremely rare; *C. B. Adams.*—Mazatlan; not uncommon, on Spondylus, Chama, &c.; *L'pool Col.*

Tablet 1539 contains 6 sp. very young, of different curvatures and proportions.—1540, 6 sp. 'monstrosum' period, do.—1541, 4 sp. adolescent. Of these two have the profile line of the plug somewhat swollen, and one is more tapering than usual. The latter may be the young of some other species.—1542, 6 sp. adult, varying in colour, arcuation, &c. One of them is curiously and beautifully encrusted; and another retains part of the decollated portion round the plug.—1543, 6 sp. of different ages with their opercula. One is of deformed growth: another, of mature breadth, is so short that it would have been considered broken were it not for the operculum. This seems to shew that the animal is not necessarily as long as the persistent shell. (Comp. C. abnormale, p. 316.)

373. CÆCUM FARCIMEN, *n. s.*

C. (Fartulum) t. "C. lævi" simili, sed albidâ, aperturâ minus contractâ; t. adultâ et interdum adolescente, annulis rotundatis paucis subobsoletis aperturam plerumque præcedentibus; septo plerumque haud elevato, apice laterali subprominente haud acuto, utráque parte angustâ; ad frontem mucronatâ, ad latus margine parum ascendente, haud rectâ; operculo concavo.

This species differs from C. læve, which it is very much like, in shape, size and general appearance, in the form of the plug which closely resembles that of C. firmatum. It rises very slowly, and in a somewhat swollen line, to a distinct lateral knob which is short and narrow. The shell generally (but not always) develops obscure rings near the aperture. In the only

specimen found in the adolescent state, these ribs remain between smooth portions, shewing the position of a former mouth. An immature specimen displays, under a high power, extremely minute longitudinal irregular wrinkled striæ, which are probably due to the epidermis. One operculum was found in situ, which appears somewhat less concave than in C. læve, but it was not extracted. An unusually large sp. measures *long.* ·064, *lat.* ·019.

Hab.—Mazatlan; very rare, off Spondylus, &c.; *L'pool Col.*

Tablet 1544 contains 4 sp.; viz. 1 adolescent, 1 immature, and 2 adult, one slender, the other swollen, with operculum.

Tablet 1545 contains a sp. probably belonging to this species, with the plug abnormally swollen and the knob divided.

374. Cæcum glabriforme, *n. s.*

C. (Fartulum) t. "C. glabro" simillimi, sed septo mamillato tumentiore, fere hemispherico; operculo ?....

One young and four adult specimens were found (with fragments); but all were dead, and the operculum was not to be seen. It is almost exactly like the British species, differing in being a trifle broader, and in having the regularly hemispherical plug much more swollen, as in the young of C. glabrum. The mouth is sharp, and scarcely contracted. It would have been curious to see whether the quoted convex operculum of C. glabrum finds its analogue in this species. *Long.* ·073, *lat.* ·017.

Hab.—Mazatlan; extremely rare, off Chama; *L'pool Col.*

Tablet 1546 contains 2 sp., young and adult, the latter, though broken, being the most characteristic in the prominence of the septum. In the British specimens, as well as in those from Mazatlan, the amount of tumidity varies not inconsiderably; so that the most prominent British shell scarcely differs from the least prominent Mexican. If it were not for the uncertainty of the operculum, added to the remoteness of habitat, the species might be united.

375. Cæcum corrugulatum, *n. s.*

C. (Fartulum) t. "C. glabriformi" simili, sed tumidiore; superficie tenuissime transversim striatâ, striulis minimis irregulariter corrugatâ; septo ?mammillato; operculo ?....

This species is constituted from a single imperfect specimen, in consequence of the peculiar sculpture which has not been observed in any other Mazatlan species. The shell appears smooth; but under a high magnifying power, it is found to be covered with most minute irregularly concentric wrinkles, like the lines on the thumb, or the muscular scar in the operculum of Murex nigritus. The plug appears to be mammillated; but, with the aperture, is imperfect. The sculpture, shewing so decidedly on a dead shell, must be very beautiful on a perfect specimen. *Long.* ·075, *lat.* ·017—·022.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 1547 contains the specimen.

376. Cæcum dextroversum, *n. s.*

C. (Fartulum) t. tereti, satis elongatâ, albâ, tenui, lævi: septo tumido, submammillato, mucrone tumidissimo, dextrorsum lateraliter verso; aperturâ parum declivi, haud contracto; operculo vix concavo.

In this species, as in C. laqueatum, the mucro, instead of being in the middle or at the back of the shell, is turned to the right; where in the young shell, which is extremely thin and slender, it appears as a conspicuous knob. As the shell increases, the body of the plug swells out and becomes mammillated, so that in certain portions it can scarcely be told from C. glabriforme, especially as the central knob is apt to be rubbed off. It is however a larger and more tapering shell. The youngest specimen, which only measures ·023 by ·008, possesses its operculum. This was also found in three other young shells, but all the adult specimens were dead. It appears to be nearly flat, but perhaps may become more concave in its adult state. The species presents such different appearances at different periods of its growth, being sometimes long and slender, at other times short and stumpy, that it has been necessary to preserve a large part of the few found. An unusually large and stout sp. measures *long.* ·092, *lat.* ·024.

Hab.—Mazatlan; very rare, (20 sp.) off Spondylus, &c.; *L'pool Col.*

Tablet 1548 contains 9 specimens, in different stages of growth, of which 8 possess their opercula.

377. CÆCUM REVERSUM, *n. s.*

C. (Fartulum) t. juniore "C. dextrorsum" simili, sed septo subconvexo, mucrone reversâ, semi-cylindraccâ, arcuatâ, aperturam versus convexâ, dorsum versus concavâ; t. adultâ ?....; operculo ?....

This species is constituted from a single young shell, in consequence of the extreme peculiarity of its plug. This, instead of having the apex turned to the back of the shell, (or central as in the mammillated species,) has the highest part towards the front. It appears like a minute curled Cæcum, lying on the slightly swollen surface of the plug, with its back towards the mouth, and its horns towards the back of the shell. It was at first regarded as a monstrosity of one of the other species; but a careful examination under a high power shews it to be quite regularly formed. *Long.* ·048, *lat.* ·012.

Hab.—Mazatlan; 1 young sp. off Spondylus; *L'pool Col.*

Tablet 1549 contains the specimen.

378. CÆCUM TERES, *n. s.*

C. (Fartulum) t. elongatâ, arcuatâ, tereti, lævi; longitudinaliter interdum obsolete subangulatâ; albidâ, seu huc et illuc semicorneâ; aperturâ parum constrictâ, dein minime reflexâ, parum declivi; septo mucronato; mucronem versus parum ascendente margine subrecto; mucrone ad frontem subelongatâ, ad latus angustâ, parvâ, obtusâ: operculo vix concavo.

This species forms the transition from the smooth to the ribbed forms; having the shape of Elephantulum, with the sculpture of Fartulum. The plug resembles that of C. farcimen, but the mucro is rather broader in the front view, though narrow at the side. The operculum, found in a young specimen, can scarcely be called concave. The texture in the finest specimen is in concentric portions of dirty white or horny, irregularly mottled. Only 5 sp. were found, in different conditions. The smallest measures *long.* ·045, *lat.* ·012.

The largest „ „ ·115, „ ·017—027.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col*

Tablet 1550 contains 3 sp. of different ages, the middle one possessing its operculum.

Tablet 1551 contains 3 pseudo-cæcous bodies, inserted for comparison. The largest of these, measuring ·045 across, was

regarded by many competent conchologists as part of a gigantic Cæcum, and is the "?Cæcum, no. 9" of my ms. catalogue. I doubt whether any of these objects be of Molluscous origin.

Family TURRITELLIDÆ.

Genus TURRITELLA, *Lam.*

H. & A. Ad. Gen. vol. i. p. 351.—*Phil. Handb. Conch.* p. 164.

379. Turritella goniostoma, *Val.*

Turritella gonostoma, *Val. Rec. Obs. Humb.* vol. ii. p. 275.
T. goniostoma, *Kien. Icon. Conch.* p. 21, no. 16, pl. 10, f. 1, (bene).—*Seba, Mus.* vol. iii. pl. 56, f. 26.—*Rve. Conch. Io.* pl. 3, sp. 10, f. 10, *a, b.*—*Mke.* in *Zeit. f. Mal.* 1850, p. 165, no. 11.
Haustator (Turritella) goniostoma, *H. & A. Ad. Gen.* i. 352.
+Turritella lentiginosa, *Rve.* loc. cit. pl. 3, sp. 9, (Payta, coarse sand, about 5 fm. *Cuming*)—*H. & A. Ad. Gen.* i. 351.
?+T. Hookeri, *Mke.* loc. cit. no. 12:—non *Rve.* loc. cit. pl. 11, sp. 61, (Antarctic Seas, *Capt. Ross.*)
Comp. T. Banksii, *Rve.* loc. cit. pl. 4, sp. 15.—*C. B. Ad. Pan. Shells*, p. 160, no. 210.—=Haustator B. *H. & A. Ad. Gen.* i. 352.
=T. Broderipiana, *D'Orb. B. M. Cat. Moll.* p. 31, no. 279. "=T. Californica, *Brod.* [!] ?young."

This species was first described from a small shell, an inch long, with 12 turns of spire, brought from Acapulco by Humboldt & Bonpland. Its W. Indian analogue is Turritella meta, *Rve.* (v. *Phil.* in *Kust.* in loco.) The form distinguished as T. lentiginosa, having the colouring "in short, transverse, linear dashings" is not so aberrant as many here catalogued. The T. Banksii has rather a more delicate style of sculpture, but is not improbably only a variety of the same species. Of the changes of colour and pattern, a sketch is given in the list below. In shape, it is either nearly smooth (except spiral striæ) with flattened whirls; or with the whirls moderately swelling; or, more usually, with an obtuse keel on the shoulder, and a few others below. The base is always ribbed, and the periphery more or less sharply keeled. It is common to find shells beginning with one form and pattern,

and changing to another. The adolescent portion is generally swollen, of smoother growth; the adult with the whirls irregular, more or less drawn out, and frequently with sharp ridges of growth behind the labrum. But whatever condition the adult may assume, the young shell always has one sharp spiral keel in the middle of each whirl, surrounded by spiral striæ. The operculum is of uniform colour, with about 18 whirls; with one row of sharp tubercular hairs next the suture, and other more stumpy ones following; with a very fine border, radiately striated, followed by a long hairy fringe. The youngest sp. has five whirls, of which the first two are smooth. It measures ·048 by ·028. An adolescent specimen (12 whirls) measures *long.* 2·07, *long. spir.* 1·64, *lat.* ·74, *div.* 22°.
The largest (17 whirls) 4·5, „ 3·88, „ ·98, „ 10°.
A slender sp. (15 whirls) 3·7, „ 3·2, „ ·82, „ 8°.
Hab.—Acapulco, *Humboldt & Bonpland.*—Panama, Kiener.—Payta, Salango, Guacomayo; in sandy mud, 5—10 fm.; *Cuming.*—S. W. Mexico, *P. P. C.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 1552 contains 6 sp. extremely young.—1553, 2 sp. young; one passing from chalcedony to purple brown, then suddenly to nearly white, then gradually to dark, linear pattern.

(1.) Tablet 1554 contains 2 sp. uniform purple black; one, whirls flat, the other rounded.—1555, 2, sp. very dark, tinted with orange brown.—1556, 2 sp. black purple ground, slightly variegated with white.—1557, 3 do. normal state, with more white; one has passed through acid, to display colour.—1558, 3 do. purple, light abounding; one in dashes above, clouded below; another with both large and small pattern.—1559, 3 do. light predominating; brownish purple in clouds, dashes or spots.

(2.) Tablet 1560 contains 3 sp. dark olive brown, with purple, linear pattern or variegated.—1561, 2 do. white abounding.—1562, 3 do. light tint, linear markings conspicuous.

(3.) Tablet 1563 contains 1 sp. purple brown passing into orange brown.—1564, 2 sp. nearly uniform orange brown; one nearly smooth, with blunt shoulder keel; the other rough, keeled above and below.—1565, 3 do. with faint purple brown cloudings; one very slender, lower whirls separating.—1566, 2 do. lower whirls passing into normal colouring.—1567, 2 do. upper half of the whirls richly variegated.—1568, 3 do. light predominating; pattern clouded or dotted.

The above series, arranged from their predominating colours, mutually pass into each other. They present the extremes of form and sculpture, and several possess their opercula. Tablet 1569 contains 3 sp. richly coloured and sculptured, with projecting ridges of growth conspicuous near the mouth.—1570, 2 sp. after severe fractures, spire twisted.

Tablet 1571 contains a minute specimen, ·038 by ·02, which may belong to this species, but develops the spiral keel much earlier and more strongly than usual.

380. TURRITELLA TIGRINA, *Kien.*

Icon. Conch. p. 29, no. 22, pl. 4, f. 2.—*Rve. Conch. Ic.* pl. 3, sp. 8.—*Mke.* in *Zeit. f. Mal.* 1850, p. 164, no. 10.

Haustator (Turritella) tigrina, *H. & A. Ad. Gen.* i. 352.

=T. imbricata, *Mke.* (quasi *Lam.*) *Zeit. f. Mal.* 1847, p. 178, no. 3.

Comp. T. Cumingii, *Rve.* loc. cit. pl. 4, sp. 13. (Panama, 11—16 fm. *Cuming;* Conchagua, *Belcher;* Gulf of California, sandy mud at low water, *Rev.—Steel.*)

Comp. T. imbricata, (*Lam.* var.) *Kien.* loc. cit. p. 11, no. 8, pl. 9, f. 2*a*.

(Light var.) Comp. T. leucostoma, *Val. Rec. Obs.* vol. ii. p. 275:—*Kien.* loc. cit. pl. 6, f. 2:—*Rve.* loc. cit. pl. 2, f. 5. (Acapulco, *Humboldt & Bonpland;* Gulf Nicoyo, sandy mud, 11 fm., *Cuming.*)

Very few specimens, and those for the most part dead, were found of this species. It is not swollen in the middle of the spire; the periphery has a blunt angle; and the upper whirls have at least five spiral lirulæ. The usual painting is a prevailing white, with large purple-black patches: but sometimes the coloured part is light reddish brown, very ill defined. Operculum with about 17 whirls, the outer ones fringed with a lighter colour, transversely wrinkled, and with a few spiral rows of hairy tubercles. A specimen with 22 whirls measures *long.* 3·33, *long. spir.* 2·87, *lat.* ·76, *div.* 15°.

Hab.—Gulf of California, Reeve.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1572 contains a young sp. of 5 whirls, measuring ·049 by ·018. The first two are smooth; the rest much rounded, with fine spiral striæ.

Tablet 1573 contains 2 normal sp., one with operculum, the other after acid.—1574, 1 sp. light var.

Family CERITHIADÆ.

Genus CERITHIUM, *Adans.*

Cerithium, *Adanson*, pars.—*H. & A. Ad. Gen.* vol. i. p. 284.—Shell with short, scarcely recurved canal; columella not plicated; paries callous; operculum Littorinoid, thick.

381. Cerithium maculosum, *Kien.*

Kien. Icon. Conch. p. 36, no. 25, pl. 13, f. 3, (non 2.)—*Lam. An. s. Vert.* vol. ix. p. 312, no. 45.—*Mke.* in *Zeit. f. Mal.* 1850, p. 178, no. 39.—(Non Vertagus maculosus, *Martyn.*) Cerithium adustum, *(Kien.* teste fig. non diagn.) *C. B. Ad. Pan. Shells*, p. 150, no. 193.—*P. P. C. Cat. Prov.*
Cerithium nebulosum, *Sow. Thes. Conch.* sp. 71, pl. 179, f. 60.
? + (var.) Cerithium adustum, *Sow.* loc. cit. sp. 70, pl. 178, f. 48.—(Non *Kien.* diagn. et f. 2.)

Kiener accurately described the Mazatlan shell as C. maculosum, but unfortunately in his plate named it C. adustum; his diagnosis of that species (loc. cit. p. 37, no. 26, f. 2 non 3;—*Lam. An. s. Vert.* ix. p. 313, no. 46) being apparently intended for a Red Sea shell. Sowerby (following *Desh.* and *Mke.*) corrects the error of the plate, but alters both the species. He changes the name of this to C. nebulosum, because as he describes the whole family as one genus, he finds this term preoccupied: and he affiliates C. adustum to a Galapagos shell, which is probably only a smooth variety of the present species. The figure is indeed coloured orange brown; but that tint is not mentioned in the description, which accords sufficiently well with the Mazatlan shell. An analogous species is C. Guinaicum *(Phil.) Sow.* from Ld. Hood's Island.

The Mazatlan species has the first 8 whirls flat, with a divergence of 43°, and sculptured with about 15 very faint transverse ribs, crossed by about 5 rather strong lirulæ. Here and there a varix is formed. Afterwards the costæ change into a row of stout tubercles, rather above the middle of the whirls, sometimes with a few rows of smaller ones on the body and base of the shell. The spiral lirulæ become very faint, and are marked by lines of brown broken up into dots. Sometimes there are large patches of blackish brown; sometimes the prevailing hue is light. The shell is generally very broad and gibbous; but sometimes it is elongated. The dwarf

specimens of this form approach Cerithium famelicum, from which it may always be distinguished by the row of very characteristic crenations along the suture. Sometimes the tubercles become rather obsolete, when it has the appearance of C. adustum, *Sow.* (non *Kien*). The adolescent shells have the mouth effuse and the canal straight. Of these very few specimens were sent. Afterwards the anterior canal is turned sharply back; the labrum being more or less pinched up at the base, so as somewhat to cover it. The large posterior canal is formed by the gradual advance of the labrum up the spire, pinched up opposite the stout labial callosity. The labrum is thin, and with the rest of the peritreme often stained with violet. The operculum is not large for the shell, with the nucleus sunken, and the few turns of spire scarcely seen outside, but conspicuous in the muscular scar inside. The outer margin is smooth; the outer surface appears so, but under the microscope displays most minute striæ in the direction of growth, still more minutely decussated into granules. The muscular scar is not corrugated as in Murex, but has very irregularly waved lines breaking up into circular spaces. The smallest adult measures *long.* 1·05, *long. spir.* ·63, *lat.* ·4, *div.* 33°.
A stumpy sp. „ „ 1·35, „ ·65, „ ·66 „ 45°.
An elongated sp. „ „ 1·7, „ ·68, „ ·68, „ 30°.

Hab.—Acapulco & Galapagos, Kiener.—Galapagos, *Cuming.*—Taboga; common in wet sand, under stones, at half tide level, *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; very common: *L'pool & Havre Coll.*

Tablet 1575 contains 3 sp. immature.—1576, 3 do. adult, different sizes.—1577, 3 do. dwarf var. elongated.—1578, 3 do. do. swollen.—1579, 3 sp. light colour.—1580, 3 do. usual state.—1581, 3 do. dark tint.—1582, 3 sp. very nodulous, (one with operc.)—1583, 3 do. slightly nodulous, elongate.—1584, 3 do. with repaired fractures.—1585, 2 sp. one with the anterior, the other the posterior canal marked off by the abnormally indented labrum.—1586, 9 opercula.

382. CERITHIUM, ?FAMELICUM, *C. B. Ad.*

C. B. Ad. Pan. Shells, pp. 152, 309, no. 196, (pars.)
= C. uncinatum (*Gmel.*) *Sow.* pars. *Thes. Conch.* pl. 180, f. 79.

Var. MEDIOLÆVE. *C. ?famelicum, t. nitidâ, epidermide subpolitâ, striulis spiralibus haud impressis: serie tuberculorum*

haud magnorum sub suturam haud impressam: serie granulorum parvorum ad peripheriam, in spirâ super suturam vix monstrante; alterâ minorum in basi; spirâ in medio anfractuum sublævi; labro obscure bigonato; canali anteriore longo, recto, declivi, vix recurvato.

=C. umbonatum, *Sow.* in Mus. Cum.

Comp. Cerithium musica, *Val. Rec. Obs.* p. 277, (Acapulco.)

This shell, named C. famelicum by Mr. Cuming as from C. B. Adams, does not agree with the description given by the Professor; still less with that of C. uncinatum, to which *Sow.* unites the species. It more nearly resembles the W. Indian C. litteratum *Brug. (Lam. An. s. Vert.* ix. 303) but is much more slender. It is characterized by the entire absence of the stout tubercles in the middle of the whirls, by a smaller row at the top, a still smaller at the bottom, and a yet smaller round the base. The labrum has two obscure angles between the canals. The glossy aspect of the shell is very characteristic and beautiful. The young shell is like the adult, but with obsolete ribs instead of tubercles. *Long.* ·98, *Long. spir.* ·67, *lat.* ·38, *div.* 25°.

Hab.—?Taboga, rare, *C. B. Adams.*—Mazatlan; 1 fresh sp.; *L'pool Col.*—S. W. Mexico, do. *P. P. C.*

Tablet 1587 contains the specimen.

383. Cerithium ?uncinatum, *Gmel.*

Murex uncinatus, *Gmel.* p. 3542, no. 57.—*Dillw. Descr. Cat.* vol. ii. p. 751, no. 146.—*Wood, Ind. Test.* pl. 27, f. 150.

Murex, no. 198, *Schroet. Einl.* vol. i. p. 611.

Strombus muricatus et marmoratus, *Schroet. Flusch.* p. 379, pl. 8, f. 15.

Cerithium uncinatum *Desh.* in *Lam. An. s. Vert.* vol. ix. p. 315, no. 49.—*Sow. Thes. Conch.* pl. 180, f. 79.

?=Cerithium famelicum, *C. B. Ad.* (pars) loc. cit.

This species suits with tolerable precision the very accurate description of *Desh.*, and in the main that of *C. B. Ad.* The locality however of C. uncinatum is unknown, and it may be a distinct though similar Caribbæan species. In that case the name C. famelicum may be retained for this shell and C. mediolæve for the Mexican. This is characterized by the row of very stout tubercles ascending the spire in the middle of each whirl; with two smaller, closer rows, one just below the suture,

the other just below the periphery, so as not to be seen in the spire; and another, smaller still, round the base. The labrum is distinctly three-cornered between the canals; anterior canal not quite so long as in C. f. mediolævæ, and rather more curved; surface less glossy; shape less slender. Only four perfect specimens were found, but fragments and young shells appeared in the Spondylus washings. The young resembles the adult, but with the tubercles semicostal. One of the specimens from S. W. Mexico is of a prevailing blackish brown. *Long.* 1·04, *long. spir.* ·7, *lat.* ·45, *div.* 35°.

Hab.—?Taboga; very rare; *C. B. Adams.*—S. W. Mexico; do. *P. P. C.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1588 contains 2 very young specimens, 1 adolescent, and 1 adult.

Tablet 1589 contains an immature specimen, which comes nearer to this species than to any other. It has the general aspect of C. maculosum, but is not like the young of that species. The upper whirls resemble those of C. uncinatum; but on the last whirl the tubercles are almost wholly obsolete, and the surface generally is granulose. The aperture also is much longer in proportion. *Long.* ·65, *long. spir.* ·38, *lat.* ·29.

384. CERITHIUM ———, *sp. ind. (a)*

Tablet 1590 contains a young sp. (and an imperfect one much younger,) measuring ·44 by ·22, resembling the shell on tablet 1589 in the general style of sculpture, but without the medial tubercles on the upper whirls, and with the canal long and straight. It has faint semi-costal tubercles below the suture, and finely granulous spiral striæ over the whole surface. It may possibly be a variety of C. famelicum.

Hab.—Mazatlan; 2 sp. young; *L'pool Col.*

385. CERITHIUM ALBOLIRATUM, *n. s.*

C. t. conicâ, turritâ, albâ; anfractibus compactis, plus minusve subconvexis; liris spiralibus valde expressis cinctâ; iii.—v. *in spirâ monstrantibus, quarum una vel duo interdum majores; costas transversas, undulatas, subobsoletas superantibus; aperturâ subquadratâ.*

The sculpture consists of fine spiral bars with well defined interstices traveling over obscure transverse ridges, which do

not appear in the earliest whirls. The outlines are more or less convex, according to the prominence or otherwise of particular keels. None of the specimens were mature, but no species has been found resembling it. The smallest sp. with 5 whirls, measures ·032 by ·023. The largest, *long.* ·122, *long. spir.* ·075, *lat.* ·067, *div.* 32°.

Hab.—Mazatlan; 10 sp. off Chama & Spondylus; *L'pool Col.*

Tablet 1591 contains 4 sp. of different ages.

386. CERITHIUM ———, *sp. ind. (b.)*

Tablet 1592 contains an imperfect specimen, closely resembling a West Indian species. It is of an orange brown, with not numerous radiating tri-tuberculous costæ.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

387. CERITHIUM STERCUS-MUSCARUM, *Val.*

Rec. Obs. Humb. & Bonpl. vol. ii. p. 278.

= Cerithium irroratum, *Gould, Proc. Bost. Soc. Nat. Hist.* 1849, p. 119:—*Exp. Shells*, p. 61.—*C. B. Ad. Pan. Shells*, p. 154, no. 209.

Cerithium ocellatum, *Mke.* in *Zeit. f. Mal.* 1850, p. 178, no. 40.—*Sow. Thes. Conch.* sp. 69, pl. 179, f. 59, 77.—(?Non C. ocellatum, *Brug.* no. 43:—*Lam. An. s. Vert.* vol. ix. p. 303, no. 30.)

Sowerby strangely unites to this species the C. interruptum, which he attributes to Gould instead of to Menke, and to which it has no resemblance. Brugière's is probably the African shell, specimens of which are in the Br. Mus. from Madagascar. They most closely resemble the Pacific species, and may hereafter be proved identical. Of the very numerous specimens sent of this shell, extremely few were quite adult, and very few young. In its ordinary state, it has a Pirenoid aspect; and the entire freedom of the specimens from the usual accretions, the erosion of the apical whirls, and the dark hue, would have led us to consider it a brackish water shell, were it not for the contrary testimony of Prof. Adams. The spire has one row of stout tubercles, but there are no granules. The mouth is generally of a lustrous black, usually broadly notched at the base; when adult, rounded, with labial callosities bounding the notch and the short posterior canal. From

the different development of the tubercles on the same whirl, the axis has occasionally a bent appearance. Gould's type appears to have been rubbed smooth and faded. The operculum is not large for the shell, and closely resembles that of C. maculosum. The nucleus however is not sunken; the surface is not minutely striated, the outer margin is irregularly indented, and the markings of the muscular scar are coarser. The upper whirls are few in proportion, with the same divergence as the adult. *Long.* 1·4, *long. spir.* ·8, *lat.* ·66, *div.* 40°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Panama & Taboga; at and above half tide level; mostly in the margin of water left in the rocks by the tide; very common, *C. B. Adams.*—Gulf of California and Galapagos, Sowerby, (Mus. Cuming.)—S. W. Mexico, *P. P. C.*—Mazatlan; abundant; *L'pool Col.*

Tablet 1593 contains 7 sp. different ages, elongated.—1594, 8 sp. do. broader.—1595, 3. sp. adult; of which one (dead) has marine attachments.—1596, 2 sp. lob-sided.—1597, 2 do. pale state.—1598, 1 sp. with operculum.—1599, 1 sp. with mended fracture.—1600, 2 sp., one with Balanus, the other bored by a Proboscidean; extremely rare.—1601, 9 opercula.

388. Cerithium interruptum, *Mke.*

Cerithium interruptum, *Mke.* in *Zeit f. Mal.* 1850, p. 178, no. 41.—*C. B. Ad. Pan. Shells*, no. 198, p. 153.—(Non Cerithium interruptum, *Lam. An. s. Vert.* vol. ix. p. 328, no. 1. Fos. Grignon.)*

? + Cerithium ———, sp. ind. *C. B. Ad.* loc. cit. no. 199.

Comp. Cerithium (Tympanotonus) Galapaginis, *A. Ad.* in *Sow. Thes. Conch.* p. 869, no. 85, pl. 182, f. 155-6.

This species agrees exactly with both the figure and the diagnosis of C. Galapaginis, but that shell is classed with Tympanotonus, with which this has no connection. It begins with three smooth whirls, which soon fall off: then a few in which the sculpture is wholly in spiral liræ, of which one just above the suture is stronger, angulating the periphery; at this stage the base is scarcely notched, and the shell closely resembles Trichotropis: afterwards the angular ridge subsides, the spiral lines become granulose and the whirls somewhat rounded.

* Should this imperfectly characterized shell prove to belong to the same genus, Menke's name must be altered. If C. Galapaginis be identical, that may be retained. If not, it may, according to custom, take the name of C. Menkei.

When adult, the canal is very short, and the labrum slightly lirate within. Colour of a prevailing blackish brown, (brown in the mouth,) variously dotted and marked with white. The operculum is very minutely granular, and closely resembles that of C. maculosum on a small scale. It differs from that of C. stercus-muscarum in being of a lighter colour, thinner, with the spiral part larger in proportion, margin more indented. muscular scar smaller, scarcely marked. The smallest specimen measures ·035 by ·027. The smallest adult, ·45 by ·2. The largest, *long.* ·6, *long. spir.* ·35, *lat.* ·28, *div.* 30°. This is considerably larger than Menke's specimen; but many of Prof. Adams' were an inch long, and of Cer. no. 199, 1·2 long.

Hab—Mazatlan; rare; *L'pool Col.*—Taboga and Panama; extremely common, on and under rocks and stones, between half-tide level, and low water mark of neap tides; *C. B. Ad.*

Tablet 1602 contains 3 sp. extremely young, and an adult with the operculum.—1603, a series of 7 sp. of different ages.—1604, 2 opercula.

Genus VERTAGUS, *Klein.*

H. & A. Ad. Gen. vol. i. p. 285. Siphonal canal strongly recurved; columella plaited: operculum as in Cerithium, (teste V. gemmatus, non teste Ad. fig.)

389. Vertagus gemmatus, *Hinds.*

Cerithium gemmatum, *Hinds, Voy. Sulph. Moll.* p. 27, no. 104, pl. 11, f. 5, 6.—*C. B. Ad. Pan. Shells*, p. 152, no. 197.—*Sow. Thes. Conch.* sp. 17, pl. 177, f. 41.

Vertagus gemmatus, *H. & A. Ad. Gen.* i. 285.

This shell is very constant in its characters; presenting a sharp, straight outline, and a sculpture consisting of 3 rows of nodules, (of which the upper is the larger,) with a double spiral line between. The nodules are but slightly developed in the young shell. There are numerous small varical ridges, but only two principal ones, at the aperture, and at about two-thirds of the last whirl. The siphonal canal in the adolescent shell is short, and but slightly recurved: afterwards longer and much bent. The posterior canal is thick, but with only a slight groove. There is no parietal knob distinct from the canal, and the columellar plait is very slight and sunken. The

operculum is on the same plan as in the Cerithia (proper); but is larger in proportion, thin near the margin, rather concave, with the spiral part saucer-shaped, bounded by a raised margin; outer surface minutely granulated, more conspicuously than in C. maculosum; muscular scar small, with very few undulating lines; remainder of inner surface extremely glossy. The smallest adult is 1·14 long; the largest measures *long.* 1·45, *long. spir.* 1·5, *lat.* ·5, *div.* 25°.

Hab.—Panama; in sandy mud, 2 or 3—7+ fm.; *Hinds.*—Taboga; very rare; *C. B. Adams.*—Mazatlan; common; *L'pool & Havre Coll.*

Tablet 1605 contains a series of 5 sp. shewing the formation of the adult mouth.—1606, 4 sp. adult, large and small.—1607, 7 sp. colour varying from light spotted, to uniform brown red.—1608, 5 sp. shewing different positions of penultimate varix.—1609, 5 sp. with irregularities of growth.—1610, 2 sp. with opercula in situ, of which one is abnormal.—1611, 1 sp. with operculum cut-off from the dead animal within. It is altogether abnormal, irregularly formed of concentric elements, deeply indented, and sculptured occasionally with a V pattern, without granules. It may be the result of the same injury to the shell which fractured the mouth and destroyed the upper whirls.—1612, 4 normal opercula.

390. VERTAGUS ——— *sp. ind.*

Tablet 1613 contains a fragment, of Cerithiopsoid aspect, but with a distinct columellar plait. The whirls are short, numerous, subquadrate, with two rows of coarse broad tubercles.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

GENUS TRIFORIS, *Desh.*

Enc. Méth. ii. p. 1053, 1830.—*Phil. Handb. Conch.* p. 166.—*H. & A. Ad. Gen.* vol i. p. 287.

Cerithium, pars, auct.

Shell reversed; canals sometimes tubular; operculum orbicular, few-whirled. This genus appears rare on the W. American coast, from which there is not one among the many species described by Hinds. Prof. Adams has described three, from a few Panama specimens, which are here adopted with great

doubt, simply because the Mazatlan shells were not numerous enough to oppose, while they did not confirm, his arrangement. While in Cerithiopsis, the sculpture is tolerably constant, in these, as in the British species, the rows of nodules and the convexity of the spire outlines vary in arrangement on the same specimen according to age. The basal sculpture does not appear in the young shell.

391. TRIFORIS ALTERNATUS, *C. B. Ad.*

Pan. Shells, no. 207, pp. 158, 310.

Shell with the first 7 whirls transparent, light horn-coloured: the first two smooth, then with numerous radiating lines, crossed by first one, then two, then three spiral ridges, which gradually become nodulous. Then of a purplish brown, for many whirls with two rows of stout, lighter-coloured nodules. Between these a fine line appears which gradually develops into first a smaller and at last an equal sized row of nodules. Below are one keel on the periphery and two on the base. The colour changes to whitish on the lower portion of the later whirls. The shell is comparatively large, a fragment measuring ·08 across. A specimen with 9 normal whirls measures *long.* ·17, *long. spir.* ·14, *lat.* ·055, *div.* 20°.

Hab.—Panama, 5 sp. *C. B. Adams.*—Mazatlan; portions of 8 sp. off Spondylus; *L'pool Col.*

Tablet 1614 contains a very young sp., a perfect adolescent one, and a fragment of an adult.

392. TRIFORIS INCONSPICUUS, *C. B. Ad.*

Pan. Shells, no. 208, pp. 159, 310.

Shell in sculpture closely resembling T. alternatus, but much smaller; with the nuclear whirls shorter in proportion, light coloured only at the apex, developing the nodules and the dark colour earlier and more gradually. Colour dark throughout; the last two whirls with 3 complete rows of nodules. Anterior spiral ribs larger, that on the periphery sometimes slightly sculptured. A specimen very perfect at the mouth but with the apex deficient, measures *long.* ·15, *long. spir.* ·115, *lat.* ·05, *div.* 18°.

Hab.—Panama; 16 sp. under stones near low water mark; *C. B. Adams.*—Mazatlan; 12 sp. more or less complete, off Spondylus and Chama; *L'pool Col.*

Tablet 1615 contains a very young sp.: the adult above measured; a fragment between the two, and another shewing a curiously mended fracture.

393. TRIFORIS ?INFREQUENS, *C. B. Ad.*

Pan. Shells, no. 209, pp. 159, 310.

A few shells are kept separate (till more specimens are obtained) as they seem to differ from Tr. inconspicuus in having the apical whirls scarcely sculptured, but soon adopting the permanent type. Prof. Adams' species is only distinguished by the number and strength of the three rows of nodules. None of the Mazatlan forms have these so large as in the British shell. A specimen with 9 normal whirls measures *long.* ·18, *long. spir.* ·135, *lat.* ·065, *div.* 20°.

Hab.—Panama; 2 sp. *C. B. Adams.*—? Mazatlan; 6 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1616 contains a young and an adult specimen.

GENUS CERITHIDEA, *Swains.*

H. & A. Ad. Gen. vol. i. p. 292:—v. *A. Ad. Monogr.* in *Proc. Zool. Soc.* 1854, p. 83.

Cerithium, pars, auct. Shell light, transversely ribbed, generally with a widely expanded mouth, rudimentary siphonal notch and decollated apex. Operculum multispiral. Animal living in brackish mud *(Nuttall)*, or out of the water on twigs.*

394. CERITHIDEA MONTAGNEI, *D'Orb.*

Cerithium Montagnei, *D'Orb. Voy. Am. Mer. Moll.* v. 443, pl. 63, f. 3, 4.—*Kien. Icon. Conch.* p. 99, pl. 30, f. 1.—*Sow. Thes. Conch.* p. 888, sp. 171, pl. 186, f. 284-6.—*Mke.* in *Zeit. f. Mal.* 1850, p. 178, no. 38.—*B. M. Cat. D'Orb. Moll.*

* Clark *(Moll. Test. Mar. Br.* p. 305*)* in accordance with a habit of generalizing for the world from the Mollusks of the South Devon fauna, surmises that all shells with multispiral opercula belong to hermaphrodite animals, and should be separated from those of paucispiral elements. If so, Cerithidea must be separated from Cerithium, Modulus from Littorina, Aletes from Siphonium, Torinia from Solarium, Adamsiella from Cyclostoma, Melanoides from Melania, Skenea from Rissoa, Valvata from Paludina, &c. Mr. Clark himself unites the multispiral genera Bittium and Skenea to the paucispiral Rissoa.

no. 374, p. 43.—*Eyd. & Soul. Voy. Bon.* pl. 39, f. 6, 7:—*B. M. Cat.* p. 34, no. 188.

Cerithidea Montagnei, *Mon.* loc. cit. p. 83.

= Cerithium Reevianum, *C. B. Ad. Pan. Shells*, no. 205, pp. 156, 310.

Comp. Cerithium pulchrum, *C. B. Ad.* loc. cit. no. 204.

That the Mazatlan shell is identical with C. Reevianum, and with *D'Orb.*'s species, is evident from a comparison of types. It is possible that *Sow.* is right in uniting also the C. pulchrum. But in affiliating the China species C. Fortunei, *A. Ad. (Mon.* l. c. no. 20) and C. Largillierti, *Phil. (Zeit. f. Mal.* 1848, p. 20, no. 83,) the latter as the young of the S. American, he displays a judgment only surpassed in singularity by that of Dr. Gray, who calls this species "only a variety of C. varicosum without varices," *(B. M. Cat.* loc. cit.) Kiener's figure is not characteristic; nor was *D'Orb.'s* sufficiently accurate for Prof. Adams to recognize the species.

None of the Mazatlan shells are so broad in proportion as C. pulchrum, *C. B. Ad.*, nor possess its sculpture. This is stated to have 40 ribs on each whirl; Mr. Cuming's type however has, as the spire ascends, about 40, 31 and 26 respectively. It differs in its regular varices, 240° distant, and in the spiral striæ, one of which is conspicuous to the top of the non-decollated spire. The continuity of the labrum and labium, by which it is further distinguished, depends on age, and is equaled in the typical form. If a variety, it is a constant one, as Prof. Adams found 125 specimens, living with the other species.

The Mazatlan specimens of C. Montagnei vary considerably in the elongation and divergence of the spire, in the number and strength of the ribs, and in the amount of spiral sculpture. In the upper whirls the ribs are comparatively distant, sharp, and never tuberculous. On the last whirl they are often very close (sometimes with a sudden change,) sometimes nearly obsolete, sometimes spirally subnodulous; varying from 26 to about 48. There is always a raised line continuing the suture, (very rarely visible in the suture of elongated specimens,) and numerous spiral striæ round the base. The surface under the microscope is often most minutely corrugated; and the epidermis, which is thin and deciduous, is spirally striated, or striato-corrugated. No varices are ever seen on the spire; and it is only a very rare accident if one other is seen besides the terminal one. The labrum is widely reflected, often in layers; and in the adult there is always a considerable thickening of

the columellar lip. The apex is always more or less decollated; fresh septa are made within; and the unused portion left to drop off or not according to circumstances. The shell is never incrusted. The operculum has about 15 whirls, with a very thin loose edge; it is slightly rugulose and concave externally, and very glossy within. The smallest of the adult specimens measures *long.* ·88, *long. spir.* ·6, *lat.* ·4, *div.* 25°.
The broadest (7 whirls) „ 1·33, „ ·9, „ ·74, „ 28°.
The narrowest „ 1·3, „ ·92, „ ·52, „ 23°.
These measurements are exclusive of the labrum, which measures in one specimen *lat.* ·12, *alt.* ·24.

Hab.—Guayaquil, *D'Orbigny.*—Panama; not uncommon, half buried in muddy sand under bushes at high water mark; *C. B. Adams.*—Mazatlan; abundant; *L'pool & Havre Coll.*

Tablet 1617 contains 6 sp. in different stages of growth; one, being broken, shews the extreme thinness of the shell, and the axis.—1618, 5 sp. adult, dwarf state.—1619, 5 sp. normal state.—1620, 3 do. ribs somewhat obsolete.—1621, 5 sp. elongated.—1622, 1 do. shewing sutural line.—1623, 2 sp. later ribs subgranulous, normal form.—1624, 3 do. elongated.—1625, 1 sp. with two contiguous varices.—1626, 1 sp. very thick varix.—1627, 1 sp. with operculum in situ, and two separate opercula.

395. Cerithidea ? varicosa, *Sow. var.* Mazatlanica.

Cerithium varicosum, *? Sow. Gen.* f. 5.—*Kien. Icon. Conch.* p. 94, no. 77, pl. 30, f. 2.—*? Rve. Conch. Syst.* vol. ii. p. 178, pl. 226, f. 5.—*Desh.* in *Lam. An. s. Vert.* vol. ix. p. 321, no. 60.—*B. M. Cat. D'Orb. Moll.* p. 43, no. 373.—*Sow. Thes. Conch.* p. 887, sp. 169, pl. 186, f. 280-2.—*? Val. Rec. Obs.* vol. ii. p. 282.
Cerithidea varicosa, *Mon.* loc. cit. p. 83.
= Cerithium validum, *C. B. Ad. Pan. Shells*, no. 206, pp. 157, 310.

C. t. "*C. varicosæ*, Sow." *simili; sed minore, gracili, unicolore, utro-fuscâ; anfr. ultimis haud subito crescentibus; columellâ vix tortuosâ; labio haud incrassato; costulis spiralibus, anfr. penult. plerumque* iv. (iii.—v.), *liras transversas parum arcuatas transeuntibus, ad interstitia nodosis; varicibus valde irregularibus.*

Comp. C. sacrata, *Gould, Exp. Shells*, p. 60: (=C. Californica, *Nutt.* ms.—Var.=C. fuscata, *Gould ms.* teste *Nutt.*) *Hab.*—Upper California.

Comp. Cerithium (Potamides) Hegewischii, *Phil.* in *Zeit. f. Mal.* 1848, p. 19, no. 81. *(Hab.*—Mexico, ? ubi.)

Desh. & *C. B. Ad.* both doubt the identity of *Sow.*'s and *Kien.*'s species. The Mazatlan shells scarcely accord with either, and may prove distinct. The genus is not yet well understood. *Sow.* unites to this *Phil.*'s species, which is probably an allied form from the West Indies; also C. iostoma, *Pfr.* (?ubi); also C. helicoide, "the narrow variety without varices," *C. B. Ad.* (?ubi); as well as (rightly) C. validum, *C. B. Ad.* "Shells of *Jamaica.*"*

The Mazatlan species scarcely agrees with the S. American shells in D'Orbigny's collection; and have much more the appearance of the variable Californian species, C. sacrata, which however has much fainter spiral and stronger transverse sculpture. It most closely resembles a W. Indian species, which is probably that intended by Philippi, but differs in its uniform dark colour. The scarcely varicose forms are known at once from the dwarf variety of C. Montagnei by the strong spiral sculpture, even on the upper whirls, the subquadrate aperture, and the absence of thick labial deposit. The surface is scarcely corrugate; epidermis rather thick, rough and deciduous. The operculum closely resembles that of C. Montagnei, but is slightly less concave, and somewhat larger in proportion. Occasionally cup-shaped bodies are found on it, which look like the remains of egg-cases. It generally measures about ·95 by ·35; an extraordinarily large one measures *long.* 1·36, *long. spir.* 1·04, *lat.* (sine var.) ·46, *div.* 20°.

Tablet 1628 contains 5 sp. in various stages of growth.—1629, 3 do. intervarical state.—1630, 4, do. solid, light mouth.—1631, 3 do. form more elevated.—1632, 5 normal state.—1633, 5 do. varices strongly developed.—1634, 3 do. varices scarcely developed.—1635, 2 sp. varying in sculpture.—1636, 2 do. mended after fracture.—1637, 1 sp. with operculum in situ; and 3 separate opercula, one of which is scarcely spiral (?through accident).

* The inaccuracy with which the labours of Prof. Adams are quoted or ignored by Mr. Sowerby, jun. may be co-ordinate with the execution of the remainder of the Monograph, but scarcely does justice to the honoured name which the author inherits.

Family LITORINIDÆ.

Genus LITORINA, *Fér.*

Littorina, *Fér. Tabl. Elém.*, 1822, p. 10, (a *littus*, poet.) et auct.
Litorina, *Phil. Handb. Conch.* p. 175, (a *litus*, norm.)

If the British species of this genus, which are living in extreme profusion within reach of naturalists, are not yet satisfactorily ascertained, it is not to be expected that those from foreign shores should be more favourably situated. Repeated and close examination of many thousand specimens from Mazatlan have involved the necessity of joining two of Philippi's species. I have therefore dedicated to him, (in remembrance of his accurate Monographs of this and many other difficult genera, and especially of his great work on the Mollusca of Sicily,) a species which the necessities of the shells seemed to require, but which may hereafter, with more copious materials, share the same fate.

Section A. Melaraphe, pars, *H. & A. Ad. Gen.* vol. i. p. 314.

396. Litorina conspersa, *Phil.*

Abbild. pt. ii. pl. 4, f. 14.—*C. B. Ad. Pan. Shells*, p. 172. no. 234.—(Melaraphe c.) *H. & A. Ad. Gen.* i. 314.
+ Litorina puncticulata, *Phil.* loc. cit. f. 15.—*C. B. Ad.* loc. cit. p. 176, no. 241.—(Melaraphe p.) *H. & A. Ad.* loc. cit.
= Litorina modesta, *Mke.* in *Zeit. f. Mal.* 1850, p. 164, no. 9:—(non *Phil.* loc. cit. pl. 6, f. 12:—*Proc. Zool. Soc.* 1845, p. 141:—*Midd. Mal. Ros.* pt. ii. p. 66, no. 9, (Sitcha & New Albion, *Barclay*):—*H. & A. Ad.* loc. cit. p. 313.

The ordinary state of the species varies between the extremes described by *Phil.* but comes nearer to L. puncticulata. The name L. conspersa is however retained, as being that by which the species is generally known, and most distinctive in derivation, there being already a L. punctata. Prof. Adams, while acknowledging that the two species approximate, is able for the most part easily to distinguish his 400 specimens. The thousands that were sent in the Mazatlan collection not only offer intermediate forms, but run so gradually into each other, as not to allow of specific separation.

The species is known by its white, or dirty yellowish colour, often dotted, especially in the young shell, with light purplish

brown; (not with red as in the Sitcha analogue, C. modesta; which it so greatly resembles in general form that *Mke.* not unnaturally mistook them, but which is put in another subgeneric group by Messrs. Adams.) The shape varies from a type even more inflated than L. puncticulata, *Phil.* to one more elevated than his L. conspersa, with every gradation between. The surface is either sculptured with prominent (though not sharp) ribs, with very broad interstices; or with smaller and very close ribs, with narrow interstices: or else the interstices degenerate into fine lines cut on the smooth surface of the shell, which is then somewhat glossy; or (in the young state) it is quite smooth and polished. The columella is much excavated, even in young shells. The mouth is generally of a rich, lustrous brown within, more or less in bands, with dots inside the labrum; but sometimes it has only the yellow of the exterior more developed. The nuclear whirls are of a purplish brown, (sometimes light) of chalcedonic texture as in Terebra, and very rarely eroded. The operculum is very regular in growth, with the spire well defined; outside with very irregular lines of growth; inside with the muscular scar beautifully striated spirally. This can be seen by transmitted light, and at once separates it from the next species. The young shell is frequently angulated at the base; and an unusually large rib often marks the periphery in the adult. A swollen sp. measures *long.* ·6, *long. spir.* ·24, *lat.* ·46, *div.* 80°.
An elongated sp. „ ·7, „ ·37, „ ·43, „ 50°.

Hab.—Real Llejos, *Hinds.*—Taboga and Panama; common, chiefly on large fragments of rock at high water mark; *C. B. Adams.*—Mazatlan; extremely common; *L'pool & Havre Coll.*

Tablet 1638 contains 7 sp. white, very ventricose.—1639, 9 do. rather less, (answering to L. puncticulata.)—1640, 7 do. ordinary state.—1641, 7 do. flattened ribs.—1642, 7 do. more elevated.—1643, 8 do. form L. conspersa, *Phil.*

Tablet 1644 contains 7 sp. very much elevated, yellowish.—1645, 11 do. series from young state ·18 by ·17.—1646, 6 do. less elevated.—1647, 8 do. whirls rounded.—1648, 7 do. usual shape.—1649, 7 do. rather flatter.—1650, 7 do. ventricose.

Tablet 1651 contains 3 sp. keels distant.—1652, 4 do. keels very close.—1653, 3 do. keels somewhat irregular, as in Purpura lapillus.—1654, 4 do. nearly smooth.—1655, 4 sp. abnormal growth.—Many of the above retain their opercula: tablet 1656 contains 9 separate ones.

397. LITORINA ASPERA, *Phil.*

Proc. Zool. Soc. 1845, p. 139:—*Abbild.* pt. ii. pl. 4, f. 13.—*Mke.* in *Zeit. f. Mal.* 1847, p. 178, no. 2: do. 1850, p. 163, no. 8.—*C. B. Ad. Pan. Shells*, p. 170, no. 232.—*?? Midd. Mal. Ros.* pt. ii. p. 66, no. 10.

Melaraphe aspera, *H. & A. Ad. Gen.* 314.

Besides the natural doubt that an essentially tropical shell extremely common at Panama, less so at Mazatlan, and not found at all on the Californian coast by the accurate observer, Mr. Nuttall, (where it is replaced by L. planaxis,) should reappear in the Boreal region of Sitcha, the description of Middendorff by no means accords with Philippi's shell. The Russian shell is "crassa, lineis nigricantibus obliquis picta, anfr. parum convexis," and is said to resemble L. ziczac and L. zebra. The evidence therefore appears to be very unsatisfactory, on which Prof. Forbes, in his Zoological Map, gives this species as characteristic of the Oregon fauna. A very different shell from Pernambuco (*J. P. G. Smith*) is also given in the B. M. as the L. aspera, *Phil.*

The Mazatlan shell is (for the genus) rather thin, and tolerably constant in characters. It is readily known when fresh from L. conspersa by the dark hue and sharp, distant ribs. In shape it goes through the same changes as its congener; but in sculpture and colour is much more constant. The ribs are sharp, with very broad concave interstices, are somewhat roughened by lines of growth, and are beautifully tinted, in ill-defined spots, with umber. The young shell (as Mke. states) has a chalcedonic apex like that of L. conspersa, below which it has generally a slate coloured band. The spots also are more defined, and run into lines. They were provisionally distinguished by Mke. as L. apicina. At this period the ribs are closer and flattened, but still much more conspicuous than the corresponding stage of L. Philippii. The apex is commonly eroded in the adult. The colour within resembles that of L. conspersa, but is generally darker. The base of the young shell also agrees in being often keeled or angulated. The operculum is rather broader than in that species, with the thin trasparent edge less defined. Inside the nucleus is raised, and is rarely seen to display the spiral elements. The muscular scar is not furnished with spiral striæ, but is irregularly roughened with minute knobs and striæ of growth. An unusually compact specimen measures *long.* ·7, *long. spir.* ·34, *lat.* ·5, *div.* 70°.
An elongated sp. „ ·64, „ ·32, „ ·4, „ 50°.

Hab.—"Sitcha, Mexico and San Salvador," Philippi.—Sitcha and New Albion, *Barclay*, (teste Midd. sed v. supra.)—Panama & Taboga; extremely common on ledges and large fragments of rocks at or above high water-mark; *C. B. Adams.*—Mazatlan; common; *Melchers.*—Do. not uncommon; *L'pool & Havre Coll.*

Tablet 1657 contains 6 sp. compact form.—1658, 6 do. normal shape.—1659, 6 do. more elevated.—1660, 6 do. elongated.—1661, 5 do. much elongated.—1662, 4 sp. ventricose.—1663, 2 do. ribs distant.—1664, 4 do. ribs close.—1665, 2 do. abnormal growth.—1666, 6 young sp. ribs very fine.—1667, 6 young sp., P. apicina, *Mke.*—1668, 6 do. elevated, approaching L. Philippii.—1669, 3 separate opercula (others in their shells.)

Tablet 1670 contains 3 very young Litorinæ, the smallest ·03 by ·024, the largest ·088 by ·055, probably belonging to this species, but too young to identify with confidence without a series.

398. LITORINA PHILIPPII, *n. s.*

L. t. inter "L. asperam" et "L. zic-zac" intermediâ; parvâ, compactâ, interdum elevatâ, plerumque gibbosâ; anfr. subplanatis, ad basin angulatis; colore livido, seu olivaceo-livido, olivaceo-fuscâ oblique strigatâ; lineis irregularibus, interdum zic-zac-formibus, interdum interruptis, tesselatis: totâ superficie nitentiore, sulcis subdistantibus subimpressis ornatâ; columellâ excavatâ; intus fuscâ, margine acuto labri plus minusve lineato; nucleo plerumque eroso; operculo tenuiore, latiore; intus nucleo vix elevato; imp. musc. minutissime scabro, lineis incrementi conspicuis, suturâ spirali haud celatâ.

This unpretending little species may be the L. aspera, var. "more slender, sculpture reduced to spiral impressed lines" of Prof. Adams. It may also form a part of the L. apicina of Menke; but as its usual character is just the contrary of his diagnosis, being almost always eroded even in very young specimens, it would have been scarcely truthful to retain the name which he provisionally gave, apparently to the young of L. aspera. The markings in this species, (which in L. conspersa are purplish brown dots, and in L. aspera umber spots) are olive brown, almost always in slanting lines more or less interrupted; and when broken up into dots, these are always square, tesselating the spaces between the spiral lines. It is

very much more common than L. aspera at Mazatlan; very young specimens of the latter being so rare that I am unable to state their exact difference, and some in each series may be wrongly placed. The ordinary specimens however are distinguished by the flattened form, and faint sculpture. The adults have a very different aspect from each other, although worn specimens may be confounded. It presents less variation of form than either of the other species; making up for this by the multiform patterns of the stripes. The operculum closely resembles that of L. aspera; but appears to differ in being more transparent, with the shagreening on the muscular scar less and the spiral striæ more conspicuous, and the nucleus less raised and displaying the spiral element. The ordinary size is ·4 by ·28; the smallest is ·18 by ·12; an extraordinarily large one measures *long.* ·6, *long. spir.* ·3, *lat.* ·35, *div.* 50°.

Hab.—Mazatlan; common; *L'pool & Havre Coll.*

Tablet 1671 contains 7 sp. ventricose, resembling the young of L. aspera,—1672, 8 sp. highly coloured, as in L. aspera, jun., but of normal shape; in the youngest, the stripes coalesce and nearly cover the shell.

Tablet 1673 contains 7 sp. stripes broad, zig-zag.—1674, 8 do. stripes narrower, hue olivaceous.—1675, 8 do. stripes interrupted in the middle.—1676, 7 do. stripes zig-zag at base.—1677, 7 sp. lines very fine, olivaceous.—1678, 7 sp. stripes not interrupted, broad.—1679, 7 do. narrower.—1680, 7 do. very narrow.—1681, 7 do. olivaceous.—1682, 5 do. stripes broken-up into tesselations.—1683, 6 do. markings extremely faint.—1684, 7 sp. spire elevated.—1685, 9 separate opercula (others in the shells.)

399. LITORINA ————, *sp. ind.*

Tablet 1686 contains 2 sp., one young and fresh, the other adult and dead, differing from the rest in colour, which is of a nearly uniform blackish brown, with faint spiral lines of white; in texture, which is nearly smooth, with a very few extremely faint spiral lines near the base; and in the columella, which is not excavated. *Long.* ·5, *long. spir.* ·25, *lat.* ·32, *div.* 50°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

The same tablet also contains a very young shell, measuring ·07 by ·05, more obtuse than the young of the other species.

SECTION B.

Shell large, Phasianelloid, rather thin, coloured; columella excavated. Animal amphibious; often found crawling up trees at a considerable distance from the sea *(Dyson.)* = Melaraphe, pars, *H. & A. Ad. Gen.* vol. i. p. 414: — ?non Melaraphe, *Mühlfeldt.* When convenience requires the subdivision of Litorina, this group, included by Lam. in Phasianella, will probably be found natural.

400. LITORINA FASCIATA, *Gray.*

Zool. Beech. Voy. p. 139.—*Sieb.* in *Wiegm. Arch.* p. 209.—*Phil. Abbild.* pt. ii. p. 37, pl. 5, f. 1, 2.—*Mke.* in *Zeit. f. Mal.* 1850, p. 163, no. 7.—*C. B. Ad. Pan. Shells*, p. 173, no. 236.—*H. & A. Ad. Gen.* i. 313.

+ Melaraphe fasciata, *H. & A. Ad. Gen.* i. 314.

This very beautiful species, of which but few specimens were found, is (as Menke remarks) intermediate between L. pulchra and L. scabra. The spire is pointed, never eroded. When young it has fine spiral striæ, and is somewhat highly coloured with orange and purplish brown in irregular bands or dashes. When adult, it is often nearly smooth, with the colour evanescent near the labrum. The operculum is very thin, with but few turns, and the nucleus not far from the middle. Surface not granulose, with rather coarse striæ of growth. The largest sp. measures *long.* 1·16, *long. spir.* ·64, *lat.* ·95, *div.* 60°.

Hab.—Tumbez, Peru, *Cuming.* — Panama; not uncommon; with L. varia, on trunks and branches of small trees growing between half tide and high water levels; *C. B. Adams.*— Mazatlan; very rare; *L'pool Col.*

Tablet 1687 contains the most characteristic specimen, with its operculum; also a very young shell; and a loose operculum.

GENUS MODULUS, *Gray.*

Phil. Handb. Conch. p. 176.—*H. & A. Ad. Gen.* vol. i. p. 316.—*A. Ad. Mon.* in *Proc. Zool. Soc.* 1850, p. 203.

= Monodonta, *Swains.* = Monodonta, pars, *Lam.* — Shell nearly, generally Trochiform, with a deeply grooved columellar tooth. Operculum multispiral.

401. MODULUS CATENULATUS, *Phil.*

Trochus catenulatus, *Kust. Syst. Conch. Cab.* p. 110, no. 122, pl. 18, f. 4.—*Mke.* in *Zeit. f. Mal.* 1850, p. 173, no. 33.—*C. B. Ad. Pan. Shells*, no. 273, p. 190.
Modulus catenulatus, *H. & A. Ad. Gen.* i. 317.
=Modulus trochiformis, *Eyd. & Soul.* *Voy. Bonite*, pl. 36, f. 1—5, pl. 37, f. 25—31:—*B. M. Cat.* p. 23, no. 177.
=Modulus Carchedonicus, *P. P. C. Cat. Prov.*:—non *A. Ad.* loc. cit.: nec Monodonta carchedonius, *Lam. An. s. Vert.* vol. ix. p. 175, no. 7, (=T. perlatus, *Dillw.*=T. unidens, *Chem.* teste *Desh.*:=T. unidens, *D'Orb. B. M. Cat. Sagr. Col.* p. 21, no. 233, pars.)

The synonymy of this little understood genus has scarcely been improved by Mr. Adams' monograph of the species in the Cumingian Collection. The Lamarckian name is there assigned to the M. Sayii, *Nutt. ms.*, said to be from "Atooi, California." The genus was not found by Nuttall in California, and Atooi is in the Sandwich Islands. The Lamarckian species, which may be the Caribbæan analogue of this shell, T. angulatus, *C. B. Ad.*, or a distinct species, must revert to the old Chemnitzian name, M. unidens, teste *Desh.*

The Mazatlan shell when adult has the general aspect of a Trochus; the spire being (more or less) elevated, and the spire-outlines straight. The spire is covered with crowded subgranulous revolving striæ; and the base, which is rarely flattened, often much swollen near the very small umbilicus, has about 8 rather deeply cut grooves. Colour varying from white to light purplish brown; generally with the latter in dots. Labrum sharp, inside deeply grooved: periphery with a very sharp keel, which in young shells, or after fracture, is sometimes slightly waved, scarcely tuberculous. Operculum multispiral (not paucispiral, as stated in *Ad. Mon.* loc. cit.) with about 9 turns, very thin, transparent, edges irregularly overlapping, rather concave outside, with the surface most minutely granulose. The shells, though strong, had often received severe fractures; they were sometimes incrusted, and occasionally incommoded by Ostrea conchaphila. *Long.* ·77, *long. spir.* ·48, *lat.* ·72, *div.* 70°.

Hab.—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 1688 contains 4 sp. white.—1689, 3 do. flattened.—1690, 3 do. undulated.—1691, 4 sp. ordinary state.—1692, 3 do. flattened.—1693, 3 do. deep colour.—1694, 3 do. undulated.—

1695, 3 sp. curiously mended.—1696, 1 do. supporting 3 specimens of Ostrea conchaphila round its base. This, with several other specimens, retains its operculum.—1697, 2 separate opercula.

402. MODULUS ————, *sp. ind.*

Tablet 1698 contains a solitary and young shell resembling M. catenulatus in outline and tooth; but with a well developed umbilicus, rounded and distinctly tuberculous keel, and whirls concave above. The colour is prettily mottled with purplish brown. It differs from M. disculus in the small tooth, conical spire and concave whirls. *Long.* ·47, *long. spir.* ·3, *lat.* ·5, *div.* 80°.

Hab.—Mazatlan; 1 sp. with M. catenulatus; *L'pool Col.*

403. MODULUS DISCULUS, *Phil.*

Trochus disculus, *Phil.* in *Kust. Mart.* no. 308, p. 242, pl. 36, f. 14:—*Zeit. f. Mal.* 1846, p. 51, no. 19.
Modulus disculus, *H. & A. Ad. Gen.* i. 317.
=Modulus duplicatus, var. *A. Ad.* in *Mus. Cum.*
=Modulus dorsuosus, *Gould*, (ad fid. sp. typ.) *Mex. & Cal. Shells*, p. 10, pl. 14, f. 12.
Comp. Monodonta modulus, *Lam.* in *Kust. Mart.* no. 307, p. 241, pl. 36, f. 11—13. (*Hab.*—W. Indies.)

Known from M. catenulatus by the depressed spire, somewhat rounded and strongly tuberculous keel, violet-tinted mouth, and very deeply cut tooth, with a broad groove on the base. The young specimens are imperforate, but the old ones have a small umbilicus. It most closely resembles one of the W. Indian species. *Long.* ·6, *long. spir.* ·32, *lat.* ·65, *div.* 110°.

Hab.—Mazatlan, Philippi.—Do.; 3 sp. with M. catenulatus; *L'pool Col.*—"Found at Acapulco, *Col. Jewett*," Gould.

Tablet 1699 contains a young and an adult specimen.

GENUS FOSSARUS, *Adanson.*

Fossar, *Gray, Syn.* 1840:—*Proc. Zool. Soc.* 1847, p. 151, no. 206, (Forsar, *err. typ.*)
Fossarus, *Phil. Arch. f. Nat.* i. p. 42, 1841:—*Handb. Conch.* p. 173.

Maravignia, *Aradas & Maggiore*, 1842.
Phasianema, *Searles Wood, Crag Moll.* 1842.
Animal with two frontal lobes between the tentacles; shell umbilicated, sculptured, mouth semilunate.

404. FOSSARUS TUBEROSUS, *n. s.*

F. t. "Fossaro angulato" simili, sed anfr. vi., *quarum* iv. *tuberosi, rubri, concentrice tenuissime lirati, interdum carinati; anfr.* ii. *normalibus, albido-fuscis, plus minusve tumentibus, carinis et liris plus minusve irregulariter extantibus; labio excavato; umbilico et staturâ maxime variantibus; epidermide interdum setosâ.*

=? Trichotropis, sp. 1. *P. P. C., Cat. Prov.*
Comp. Adeorbis scaber, *Phil.* in *Zeit. f. Mal.* 1848, p. 129. (*Hab.*—Panama.)

The three individuals found vary extremely in form, markings and umbilicus. They agree however in the remarkable character of the vertex, which is like that of (Tuberia) supralirata, and is set rather slanting on the body whirls. These are either regular, or suddenly bulging, as in the polymorphous Dundry fossil, Cirrus nodosus, *Sow.*, and are marked with irregular costæ, two or more of which develop into keels. In the spreading form the umbilicus is very large; in the compact state very small. A young spreading sp. measures ·032 by ·03, div. 90°; a larger compact one, *long.* ·043, *long. spir.* ·015, *lat.* ·38, *div.* 60°.

Hab.—Mazatlan; extremely rare, off Chama and Spondylus; *L'pool Col.*

Tablet 1700 contains the two extreme specimens.

405. FOSSARUS ANGULATUS, *n. s.*

F. t. subovoideâ, tenui; albido-fuscâ, atro-purpureo irregulariter maculosâ; spirâ subacutâ, anfr. iv. *quorum duo nucleosi, læves; carinis angulatis circiter* vi. *quarum duæ tresve extantiores sunt, striulisque spiralibus creberrimis, ab epidermide tenuissime cancellatis, eleganter exculptâ; umbilico magno, acute carinato; labro tenui, angulato; peritremati continuo; labio vix excavato, haud plicato.*

Two specimens of this species were found, differing somewhat in the prominence of the angular keels. It displays no trace of callosity on the pillar lip, and is known at once from Isapis maculosa by the acute spire, and the very fine spiral striæ and keels. The older (worn) specimen measures *long.* ·07, *long. spir.* ·025, *lat.* ·063, *div.* 80°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1701 contains the fresh specimen, almost translucent.

Subgenus ISAPIS, *H. & A. Ad.*

Gen. vol. i. p. 320. Part of the diagnosis of this group is only of specific value, being founded on the ?Narica anomala, *C. B. Ad. (Contr. Conch.* no. 7, p. 109,) from Jamaica. The Mazatlan species agree exactly with Fossarus except in the columellar plait, which is obtuse and small in I. ovoidea, (Narica ovoidea, *Gould, Cal. & Mex. Shells,* p. 7, pl. 14, f. 10, "purchased at Mazatlan, *Col. Jewett*;") and in I. maculosa is almost obsolete. A similar structure appears in Purpura columellaris: in Cuma tectum, it becomes a Turbinelloid fold.

406. Isapis maculosa, *n. s.*

I. t. subovoideâ, inflatâ, tenui; albidâ, fusco-purpureo maculosâ, subnacreâ; apice planato; anfr. iii., *rapide augentibus; liris spiralibus validis, extantibus, subquadratis, circiter* x., *quarum* iv. *in anfr. penult. videntur, ducque umbilicum magnum entrant; interstitiis tenue cancellatis; epidermide sublamellosâ; peritremati continuo; labro acuto, à liris palmulato, intus sculpturam externam monstrante: labio vix arcuato, callositate medianâ, obtusâ, inconspicuâ munito.*

Differs from I. ovoidea in its small size, depressed spire, flattened vertex, shouldered whirls, deeply spotted surface (the spots being conspicuous even in a very dead shell), scarcely excavated labium, and very obtuse deposit, which can hardly be seen except in the broken shell. In other respects there is a great correspondence. The lustrous hue of the interior is a good distinguishing character. *Long.* ·118, *long. spir.* ·038, *lat.* ·112, *div.* 90°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1702 contains a beautiful young specimen, ·035 by ·025, and a perfect adult.

407. ?Isapis ———, *sp. ind.*

Tablet 1703 contains a fragment of a species resembling I. ovoidea, but with very numerous fine spiral ribs, with broad concave interstices, crossed by transverse ridges most developed on the penultimate whirl.

Hab.—Mazatlan: 1 sp. on Spondylus; *L'pool Col.*

Family RISSOIDÆ.

Genus RISSOINA, *D'Orb.*

Voy. Am. Mer. 1840, p. 395.—*Phil. Handb. Conch.* p. 172.= *H. & A. Ad. Gen.* vol. i. p. 327.—Base slightly channeled, labrum thickened, operculum neritoid.
Rissoa, pars, *auct.*

408. Rissoina stricta, *Mke.*

R. t. albâ, subturritâ, solidâ, anfractibus ? x., *apice* ?.....; *labro incrassato, ad mediam partem producto; labio parvo, reflexo; columellâ truncatâ; costis radiantibus subrotundatis, in anfractu utroque circiter* xx., *striulis spiralibus obsoletis; suturâ impressâ, costis ad apicem continuis.*

Rissoa stricta, *Mke.* in *Zeit. f. Mal.* 1850, p. 177, no. 37.
Comp. Rissoa fortis, *C. B. Ad. Pan. Shells*, pp. 178, 314, no. 245.
Comp. Rissoina pyramidata, *A. Ad.*

A single specimen of this shell was found by Mr. Hanley in the Spondylus washings. Menke's shell is still larger, measuring 3·7 by 1· lines. Even Mr. Hanley's specimen is very much larger than R. Woodwardii, which in general form it much resembles, measuring *long.* ·27, *long. spir.* (apice carente) ·17, *lat.* ·11, *div.* 20°.

Hab.—Mazatlan; extremely rare; *Havre Col.*

Tablet 1704 contains some fragments which seem to belong to this species, with an apex resembling that of R. Woodwardii, but larger in proportion; and a sketch of the unique shell in Mr. Hanley's Collection.

409. RISSOINA ———, *sp. ind.*

Tablet 1705 contains a very young shell and a fragment of adult, of large size, differing from R. stricta in the extreme sharpness of the ribs. It appears to be most minutely striulated transversely.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

410. RISSOINA WOODWARDII, *n. s.*

R. t. minore, elongatâ, angustâ, albidâ, interdum alabastro simili; anfr. vii.-viii. *subplanatis, quorum* iii. *primi læves, tumidiores; suturâ impressâ; marginibus spiræ excurvatis; costis* xii.-xiv. *in anfr. utroque angustis, acutioribus, lineis declivibus apicem versus ascendentibus; aperturam versus sæpe crebrioribus; t. juniore ad. basin elongatam evanidis, seniore basin subelongatam amplectantibus; interstitiis latis, concavis, interdum minutissime striulatis, striulis costibus parallelis; aperturâ normali; axi t. juniore productâ, subcanaliculatâ, seniore subemarginatâ, plicâ seu lineâ spirali nullâ; labio solidiore.*

Comp. Rissoa clandestina, *C. B. Ad. Pan. Shells*, p. 177, no. 243.

Comp. Rissoa firmata, *C. B. Ad.* loc. cit. no. 244.

Comp. Rissoa Bryerea, *Mont.* in *Forbes & Hanl. Br. Moll.* vol. iii. p. 149.

The Mazatlan species (of which about 70 adult specimens were found, and as many young and fragmentary,) is very uniform in its characters; and is distinguished by its small size, shape and distant ribs, (generally 13 on the penultimate whirl,) entire absence of spiral sculpture, and most minute transverse striulation, which is generally seen in the young shell, but very rarely in the adult, and then only under a good microscope. In the pseudo-British species, of which even Montague's small [?] variety is much larger, the ribs are much closer, and the transverse striæ are strong enough to be seen in dead specimens. It appears about the size of R. clandestina, but agrees better in sculpture with R. firmata. It is not conspecific with any of the similar E. or W. Indian species that I have been able to subject to the ordeal of the microscope. An unusually large sp. of the Mazatlan shell measures *long.* ·123, *long. spir.* ·08, *lat.* ·053, *div.* 24°.

Hab.—Mazatlan; rare, on Chama and Spondylus; *L'pool Col.*

Tablet 1706 contains a series of 11 specimens of different ages, beginning from ·027 by ·018, and presenting the extremes of variation.—1707, 2 sp. alabastrine variety, and as a contrast, one with black incrustation; also 2 fragments to illustrate the adolescent and the adult basal sculpture.

Genus RISSOA, *Fréminville.*

Bull. Soc. Philom. 1814, p. 7.
Loxostoma, *Bivon.* 1832.—Lamarckia, *Leach.*—Gonostoma, *Mühlf.*

411. ?Rissoa lirata, *n. s.*

? R. t. conoideâ, albido-fuscâ, solidiore; anfr. vi., *quorum* ii. *primi tumidiores, lævi; reliqui plani, eleganter lirati, liris plurimis (in spirâ circiter* x.*) extantibus, interstitiis æquantibus, quadratis; sulco latiore circa peripheriam, suturam superante; anfr. radiatim obsolete undatis, prope suturam subnodosis; marginibus spiræ excurvatis; basi subangulato; aperturâ subovali, peritremati continuo; labro antice expanso: operculo solidiore, corneo, rufo-fusco, semilunato, convexo; elementis concentricis; nucleo subcentrali, marginem interiorem versus; intus processu conico anteriori prælongo, extante, costâ ad alterum marginem decurrente.*

Of this beautiful shell one perfect specimen was found with its operculum. This makes its generic position doubtful; as it presents the concentric elements of Jeffreysia and the anteriorly projecting process of Rissoina, in conjunction with a shell typically Rissoid. The nucleus is projecting, and situated about half way between the centre and the inner margin. It appears that the entire sculptured layer may be abraded; for a specimen was found (which but for one in an intermediate state would surely have been regarded as a distinct species) without either liræ or transverse waves, and scarcely shewing the sutural furrow; but with a smooth surface most delicately corrugated transversely. *Long.* ·12, *long. spir.* ·073, *lat.* ·063, *div.* 25°.

Hab.—Mazatlan; 9 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1708 contains the perfect and the abraded specimens.

Genus ALVANIA, *Risso.*

In this section are deposited certain turrited Rissoidæ, with tumid whirls. They do not however correspond with the genus as defined by *H. & A. Ad. Gen.* vol. i. p. 330.

Cingula, pars, *C. B. Adams.*

412. ?Alvania excurvata, *n. s.*

?A. t. tenui, turritâ, elongatâ, purpureo-fuscâ, pupæformi, marginibus spiræ excurvatis; anfr. viii. *quorum* ii. *primi purpurei, læves, apice planato; dein* iii. *tumidiores, bi- seu tri-carinati; reliqui subplanati, sculpturâ minus expressâ; superficie valde irregulariter cancellatâ; costis obtusis, sæpe obsoletis, circiter* xx., *ad peripheriam evanidis; liris spiralibus quarum plerumque* iii. *spirâ monstrantur, circa basin (in juniore interdum lævem) subangulatam circiter* iii.; *interstitiis haud impressis, nunc liris nunc costis superantibus; aperturâ subovali, subquadratâ; labro tenui; labio tenuissimo, rimulam umbilicalem vix monstrante.*

This shell, in its regular growth and markings, reminds us of Turritella goniostoma. About 100 specimens were found, but most of them were extremely imperfect. *Long.* ·112, *long. spir.* ·077, *lat.* ·038, *div.* 25°.

Hab.—Mazatlan; raro, off Chama and Spondylus; *L'pool Col.*

Tablet 1709 contains 8 sp. varying in age, colour and sculpture. In one the sculptnred layer is entirely removed, and the shell is only known by its shape.

413. Alvania effusa, *n. s.*

A. t. "A. excurvatæ" simili, sed solidiore, apice acutiore, spirâ regulari, anfr. tumentibus, normaliter cancellatis; costis circiter xx. *extantibus, ad basin evanidis, à liris spiralibus circiter* xiii. *tuberculatis; interstitiis et suturis valde impressis; basi effusâ, striulis paucis axin solidam versus; aperturâ oblongâ; labro solido, interdum varicoso; labio inconspicuo; umbilico nullo.*

Only one specimen was found of this beautiful species, which is distinguished from A. tumida by its very elongated shape, and from A. excurvata by the above characters. In sculpture it resembles Phos. *Long.* ·115, *long. spir.* ·077, *lat.* ·042, *div.* 22°.

Hab.—Mazatlan; 1 sp. on Spondylus; *L'pool Col.*

Tablet 1710 contains the specimen.

414. ALVANIA TUMIDA, *n. s.*

A. t. ventricosâ, albo-fuscâ, solidâ; anfr. v. *tumentibus, subæqualiter cancellatis; costis haud obtusis circiter* xxii. *transversis, à liris spiralibus intersectis, nodosis; liris* vii., *quarum* iii. *spiram transeunt, una umbilicum satis magnum definat; interstitiis quadratis; aperturâ subrotundatâ, labro varicoso, labio tenuiore.*

Differs from all varieties of A. excurvata in its very tumid growth, umbilicated base, and thickened lip. *Long.* ·057, *long. spir.* ·034, *lat.* ·033, *div.* 40°.

Hab.—Mazatlan; 2 dead sp. off Spondylus; *L'pool Col.*

Tablet 1711 contains one specimen.

415. ?ALVANIA ———, *sp. ind.*

Tablet 1712 contains a white, rather solid shell, with very tumid whirls and a round mouth. It might pass for a Scalaria, but has no ribs; or for an Aclis, but the apex is dextral. One whirl has perished; the remaining seven measure *long.* ·048, *long. spir.* ·03, *lat.* ·027, *div.* 30°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

GENUS CINGULA, *Flem.*

H. & A. Ad. Gen. vol. i. p. 334.—Cingula, pars, *C. B. Ad.*

416. ?CINGULA ———, *sp. ind.*

Tablet 1713 contains a short, broad, white, smooth, rather solid shell, with flattened whirls, of Odostomoid appearance; but the apex appears dextral. The peritreme is continuous and not plaited. It has five whirls, and measures *long.* ·053, *long. spir.* ·03, *lat.* ·033, *div.* 43°.

Hab—Mazatlan; 1 sp. off Chama; *L'pool Col.*

GENUS HYDROBIA, *Hartm.*

Sturm, Deutsch. Faun. vi. 5, p. 47, 1821.—*Phil. Hand. Conch.* p. 168.—*H. & A. Ad. Gen.* vol. i. p. 335.

Leachia, *Risso*, 1826.—Paludestrina, *D'Orb.* 1840.—Paludinella, *Lov. Midd.* (? = Paludinella, *Pfr.*)

Rissoa, pars, *auct.*

417. HYDROBIA ULVÆ, *Penn.*

Turbo ulvæ, ? *Penn. Br. Zool.* vol. iv. p. 132.—*Mont. Test. Brit.* vol. ii. p. 318.—*Forbes & Hanl. Br. Moll.* vol. iii. p. 141.

Paludinella stagnalis, *(Linn.) Midd. Sib. Reise* p. 129.—? = Helix stagnalis (prima) *Linn. Syst. Nat.* no. 1248:—*Hanl. Ips. Linn. Conch.* p. 380.

Hydrobia ulvæ, *H. & A. Ad. Gen.* i. pl. 35, f. 10, 10*a*, *b*, *c*.

As the Mazatlan shells, after careful microscopic examination, do not offer the slightest specific difference from the British specimens, it did not seem allowable, merely for geographical reasons, to impose upon them a new name. Whether it be the first H. stagnalis of *Linn.* as Middendorf supposes, is a matter of doubt; v. *Hanl.* loc. cit. The well known name of the English writers is therefore chosen; and for the synonyms, the *Br. Moll.* and *Midd. Sib. Reise* may be consulted. The Mazatlan specimens were small, measuring *long.* ·1, *lat.* ·058.

Hab.—Europæan seas, in brackish water, *passim.*—Caspian Sea, *Eichwald.*—Massachusetts and New York, teste Middendorff.—South Coast of Okotsk Sea, on Algæ, *Middendorff.*—Mazatlan; 4 sp. in shell washings;—*L'pool Col.*

Tablet 1714 contains the smallest and the largest specimens.

418. ? HYDROBIA ————, *sp. ind.*

Tablet 1715 contains a shell resembling H. ulvæ, but with the apex more prominent, the whirls more swollen, and a spiral raised band running round a fairly developed umbilicus. It has four whirls, and measures *long.* ·036, *long. spir.* ·016, *lat.* ·028, *div.* 50°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

FAMILY JEFFREYSIADÆ.

GENUS JEFFREYSIA, *Alder.*

Forbes & Hanl. Br. Moll. vol. iii. p. 151, 1850:—*An. & Mag. Nat. Hist.* 1851, vol. vii. pp. 193, 460.—*Woodw. Man.* i. 137.—*Phil. Handb. Conch.* p. 172.

Rissoella, *Gray* (sine diagn.) *Proc. Zool. Soc.* 1847, p. 159, no. 286:—*Fig. Moll. An.* 1850, p. 86.—*Phil. Handb. Conch.* p. 195.—*H. & A. Ad. Gen.* vol. i. p. 325.

419. JEFFREYSIA* BIFASCIATA, *n. s.*

J. t. subelevatâ, diaphanâ, tenuissimâ, lævi, anfr. v. *subtumidis, suturâ impressâ; lineâ spirali subsuturali; anfr. primo minutissime granulato; pallide fuscâ, fasciis spiralibus duabus fuscis ornatâ; aperturâ subovali, peritremati continuo, umbilico minimo; operculo rufescente, haud tenuissimo.*

Variat *t. plus minusve elongatâ; colore quoque pallido seu corneo.*

Of this species, beautifully lustrous when viewed under the microscope with a good light, about 90 specimens were obtained, probably from the Algæ on the Uvanillæ. They are most likely of somewhat sedentary habits, as even in a living state they are not unfrequently incrusted with Coralline. The dried animals have a rich brown colour. Several retained their opercula, which are perfectly normal, and of a reddish brown. *Long.* ·055, *long. spir.* ·032, *lat.* ·03, *div.* 30°.

Hab.—Mazatlan; rare, on ? Algæ; *L'pool Col.*

Tablet 1716 contains 3 sp. richly coloured, of which 2 retain their opercula.—1717, 3 sp. pale non-banded variety, one with beautiful incrustation of Coralline.

420. ?JEFFREYSIA ALDERI, *n. s.*

J. t. "J. bifasciatæ" simili, sed solidiore, multo majore; anfr. v. *magis planatis, fasciis angustis.*

Three dead specimens were found on Chamæ which appear to be a distinct species. Of the very numerous specimens of J. bifasciata, none approached it in size, though the number of whirls is the same. The station appears to be different, and the whirls flatter. It is dedicated to one who stands unsurpassed for accuracy and courtesy among British Malacologists, and to whom we owe the first full description of this very interesting genus. *Long.* ·068, *long. spir.* ·035, *lat.* ·044, *div.* 35°.

Hab.—Mazatlan; extremely rare, on Chama; *L'pool Col.*

Tablet 1718 contains the least incrusted specimen.

* As a name, Rissoella has precedence; but as the first accurate account of the genus was given by Alder, it seems fair to adopt his designation; especially as Rissoid names are sufficiently plentiful, and the other is at the same time distinctive, and preserves the remembrance of one of the most accurate labourers in British Malacology. Philippi has settled the difficulty by adopting both names as separate genera, of which he places Jeffreysia in Paludinidæ and Rissoella in Eulimidæ.

421. JEFFREYSIA TUMENS, *n. s.*

J. t. tumente, diaphanâ, lævi, tenuissimâ, albidâ; vertice depressâ; anfr. iv. *convexis, marginibus spiræ excurvatis; aperturâ subovali; umbilico magno, carinato; operculo tenuissimo, translucido.*

Differs from the least elevated form of J. bifasciata in its very swelling and somewhat irregular whirls, transparent white texture, and large angulated umbilicus. The operculum, which was found in five out of the thirteen specimens, is perfectly transparent, appearing black from the remains of the animal, which seems to have been differently coloured from that of J. bifasciata. *Long.* ·048, *long. spir.* ·026, *lat.* ·038, *div.* 55°.

Hab.—Mazatlan; very rare, off Chama and Spondylus; *L'pool Col.*

Tablet 1719 contains 2 sp.; one young and glossy, with the operculum so situated as to shew the medial process; the other adult.

422. ?JEFFREYSIA ———, *sp. ind.*

Tablet 1720 contains a horny, transparent shell of three whirls, exactly like a small Ampullaria. It may possibly be a nucleus, but is much more normally shaped than the many such that I have examined from this collection. Another imperfect specimen was found with an additional half whirl. *Long.* ·046, *long. spir.* ·009, *lat.* ·044, *div.* 130°.

Hab.—Mazatlan; 2 sp. on Chama; *L'pool Col.*

FAMILY TRUNCATELLIDÆ.

These shells are ranked with Cyclostomidæ by *Phil.* and *C. B. Ad.*; with Littorinidæ by *Woodward*; doubtfully with Pyramidellidæ by *Forbes*; between Dentalium and Pyramidella by *Gray*, 1847; between Cæcum and Pyramidella, do. 1850; between Lacuna and Planaxis, *do.* 1855. For an account of the animal of the Tr. Montagui, v. *Clark Moll. Test. Mar. Br.* p. 380, according to whom it is an undoubted Littorinid.

Genus TRUNCATELLA, *Risso.*

423. ?Truncatella ———, *sp. ind.*

Tablet 1721 contains an extremely young shell and an older fragment, which may belong to this genus. The young shell looks like an Aclis; but the vertex, as in Tr. Montagui is not sinistral; but mammillated, with the first whirl sunken and scarcely oblique. It has three and a half normal and very tumid whirls, scarcely diverging; and is very much smaller than the corresponding state of Tr. Montagui, only measuring *long.* ·043, *lat.* ·015. The fragment is ·027 across, with a continuous peritreme, large umbilicus and smooth exterior.

Hab.—Mazatlan; off. Spondylus, extremely rare; *L'pool Col.*

Family PLANAXIDÆ.

Genus PLANAXIS, *Lam.*

424. Planaxis nigritella, *Forbes.*

Proc. Zool. Soc. Dec. 1850, p. 273, pl. 11, f. 6.
=Planaxis acutus, *Mke.* in *Zeit. f. Mal.* Nov. 1850, p. 169, no. 23.
+Planaxis obsoletus, *Mke.* loc. cit. p. 170, no. 24.

Although Menke's names have a month's priority, yet as the description of Forbes is much more accurate, and represents the whole species, while Menke only indicates the extreme forms, it is here preserved. It is given on the authority of the Kellettian collections as from San Juan *Del Fuaco*: but as it is an extremely abundant shell, and yet was not found, either there or along the Californian coast, either by Mr. Nuttall or the Transatlantic collectors, it is probable that the specimens were collected at San Juan in the Gulf of California, or even at Mazatlan. That they are identical with the Mazatlan species is proved on comparison by the remarkable epidermis, which lies in an irregular mass, grooved in a comb-like manner diagonally; and when this is removed, there appears a fine velvety coat lying in the interstices. This peculiarity, by which it may easily be separated from the very similar P. semisulcata of the W. Indies, is found in both of Menke's forms, which pass into each other by insensible gradations. The nucleus has three tuberose whirls, with a flattened apex, very

finely striated across; the whirls then rapidly enlarge, and are at first smooth, then more or less spirally grooved. The mouth in the young shell is elongated, as in young Cerithia; and in the very early stage, the general appearance is that of Litiopa, some species of which also have the first whirls abnormal. The shell varies in the greater or less elevation of spire, strength and frequency of spiral ridges, and in colour from brown to nearly black. The operculum is very thin; slightly spiral, as in Nerita; with the apex rather further off from the extremity than is shewn in the figure in the P. Z. S. The tuberous nucleus is not seen in the adult, of which a normal specimen measures *long.* ·48, *long. spir.* ·22, *lat.* ·33, *div.* 55°. The youngest specimen is ·05 long.

Hab.—"Straits of Juan del Fuaco," Forbes. [?]—Mazatlan; in extreme profusion; *L'pool Col.*

Tablet 1722 contains a series of 262 specimens, obtained by repeated elimination from the examination of many thousands, and representing every observed variation of age and form; also several loose opercula.

Genus ALABA, *H. & A. Ad.*

Testa ovoidea seu elongata; lævis, seu varie sculpta; anfractibus primis abnormalibus, tuberosis, vertice submamillato, vix declivi; aperturâ ad basin effusâ seu angulatâ; columellâ haud plicatâ.

Pars=Alaba, *H. & A. Ad. Gen.* vol. i. p. 241: (diagn. auct.)

The species here grouped together, from their general form and sculpture have relations with Odostomia, Chemnitzia and Eulimella; but are separated from them by the want of sinistral apex, which seems to be compounded for by the abnormal character of the first three or four whirls. These are always different from the rest, either in sculpture, divergence or both; and generally present the appearance of a tuberous root. In this respect they have relations with Stylifer, from which they differ in the straightness of the axis, the want of sinistral apex, and the strong sculptured habit of many of the species. In some respects they resemble Litiopa; but differ in habit of growth, and in the want of Achatinoid truncation of the base. Not knowing any genus in which they could consistently remain, I had described them under the provisional name of Tuberia. But as the typical species is clearly congeneric with

Alaba, (described in English by Messrs. Adams as a subgenus of Cerithiópsis,) there did not appear cause for adding another name for those species which do not accord with their diagnosis. The description of Tuberia is however retained, in order to include the whole group. Their true position, of course, can only be satisfactorily shewn when the animals have been examined.

425. ALABA SUPRALIRATA, *n. s.*

A. t. tenui, conicâ, albidâ, postea fusco irregulariter strigatâ; nitidâ, subdiaphanâ; marginibus spiræ variantibus; vertice minimo, rotundato, parum declivo; dein anfr. iv. *tuberosis, marginibus plus minusve parallelis, suturis parvis, tenuissimo transversim lirulatis, lirâ spirali supramedianâ; dein anfr.* iv. *subnormalibus, lævibus, subplanatis, conicis, suturis haud impressis; peripheriâ vix rotundatâ, aperturâ subquadratâ, ad basin subangulatâ; dein anfr.* iii. *normalibus, tumidis, spiraliter tenue striatis, striis distantibus; varicosis, varicibus quoque in anfractu tribus, attingentibus, tumidis, concavis; aperturâ subovali; labro tenui, ad basin undato; labio tenuissimo, parvo; columellâ vix intortâ.*

About 50 specimens were found of this remarkable shell; but most of them so very imperfect, and so different in character at different periods of growth, that only the late and fortunate discovery of a fresh adult specimen, led to their identification. In its usual adolescent state, it might rank as a Eulimella, but for the want of the Chemnitzoid apex. It has one whirl, sufficiently sloping to give the top of the striated portion a mammillated appearance. The first four whirls look like a thimble, and differ from the rest not only in sculpture, but in the margins which are nearly parallel; while afterwards they are more or less divergent, resembling in their irregularity some species of Stylifer. After however making four whirls in an apparently normal condition, it changes again, and assumes a Bittioid aspect. The flattened whirls become tumid, their smooth surface spirally striated, the porcellanous white a rusty brown in irregular stripes, and the periphery rendered irregular by tumid hollow varices, three in a whirl. The mouth which has always been angular at the base of the columella, now develops a very slight wave, scarcely amounting to a notch. As far as the specimens shew, this is the end of its changes. It most closely resembles a W. Indian species, Cingula tervaricosa, *C. B. Ad.*, which however is larger, with

the whirls more regularly divergent, and not so tumid towards the end. This has the same kind of sculpture on the nucleoid whirls, but is wanting in the spiral line which is characteristic of the Mazatlan shell. An adolescent sp. with three subnormal whirls, measures *long.* ·067, *long. spir.* ·04, *lat.* ·035, *div.* 30°. The largest „ ·19, „ ·125, „ ·075, „ 22°.

Hab.—Mazatlan; very rare, on Chama and Spondylus; *L'pool Col.*

Tablet 1723 contains a young sp., the most perfect adult, and a broken sp. with the nuclear portion distinct.

426. ALABA VIOLACEA, *n. s.*

A. t. solidiore, conicâ, lævi; anfr. primis lævibus, tumidis, violaceis, pavum divergentibus, haud planatis, suturis impressis, albidis; peripheriâ vix angulatâ, umbilico nullo; superficie transversim minutissime rugulosâ.

This shell has unfortunately lost its apical whirl, and the last; but the characters are sufficiently distinct. It differs from A. supralirata in the smoothness and tumidity of the tuberose whirls; and in the extremely minute corrugation of the otherwise smooth surface, in which it agrees with A. mutans and ? Chrysallida clausiliformis. The specimen has three normal whirls; and measures (allowing for the apex) *long.* ·06, *long. spir.* ·037, *lat.* ·032, *div.* 35°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1724 contains the specimen.

427. ALABA TEREBRALIS, *n. s.*

A. t. solidâ, conicâ, apicem versus acutissime terebrante, albofuscâ, lævi; anfr. primis parum rotundatis, maxime elongatis, angustissimis, marginibus pæne parallelis; anfr. normalibus planatis, suturis haud monstrantibus, marginibus spiræ dilatantibus; basi parum rotundatâ, umbilico nullo.

The only specimen found is in a similarly imperfect state with that of the last species; from which it differs in the great elongation of the less swollen tuberous whirls, and in the Eulima-like aspect of the flattened normal whirls. Of these there are four; and the specimen measures *long.* ·067, *long. spir.* ·045, *lat.* ·03, *div.* 40°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1725 contains the specimen.

428. ALABA ALABASTRITES, *n. s.*

A. t. solidissimâ, albâ, turritâ; vertice anfr. uno et dimidio minimis, parum declivibus, immersis; dein anfr. iii. *tuberosis, lævibus, marginibus divergentibus; compactis, curtis, subplanatis; dein anfr. normalibus subplanatis, parum compactis, liris solidis transversis circiter* xvi. *in lineas rectas à vertice basin versus continuis, suturis impressis; liris ad peripheriam evanidis; umbilico nullo; marginibus spiræ rectis, haud multum divergentibus.*

In this species, the sculpture of which is like a very strongly marked Chemnitzia, the tuberous whirls are compact, thimble-shaped, and rather diverging, so that the last of these has a rather larger diameter than the first of the normal ones; which then proceed at a rather less angle of divergence. The only specimen is broken below; it has three normal whirls, and measures *long.* ·055, *long. spir.* ·035, *lat.* ·027, *div.* 27°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1726 contains the specimen.

429. ALABA SCALATA, *n. s.*

A. t. tenuissimâ, elongatâ, Chemnitzi-formi, albâ; vertice minimo, rotundato, parum declivi; dein anfr. iii. *tuberosis, lævibus, subrotundatis; dein anfr. normalibus elongatis, lirulis transversis acutis (circiter* xxv.*) ornatâ, circa basin subrotundatam vix continuis; aperturâ subquadratâ, ad basin angulatâ.*

This Chemnitzoid shell is not unlike Parthenia scalariformis; but presents the tuberous whirls with the rounded top instead of the sinistral apex. It has only one normal whirl and a half, and measures *long.* ·036, *long. spir.* ·02, *lat.* ·018, *div.* 20°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1727 contains the specimen.

430. ? ALABA CONICA, *n. s.*

? A. t. conicâ, Trochoideâ, albidâ; anfr. primis subtuberosis, lævibus; dein valde divergentibus, anfr. normalibus iv. *planatis, costis radiantibus circiter* xvi., *marginibus spiræ rectis convenientibus, undulatis, ad peripheriam angulatam truncatis; lirulis spiralibus supereuntibus, in spirâ circiter* vi., *in basi planatâ circiter* vi. *rotundatis; suturâ excavatâ; aperturâ subquadratâ, ad basin angulatâ; labio tenui, umbilicum parum monstrante.*

This shell closely resembles Chrysallida nodosa in form and sculpture; but although the specimens were broken, there is no indication of columellar fold; what remains also of the apex accords better with Alaba than with that genus. The character of the mouth comes nearest to A. supralirata. *Long.* ·08, *long. spir.* ·044, *lat.* ·056, *div.* 50°.

Hab.—Mazatlan; 4 sp. off Spondylus; *L'pool Col.*

Tablet 1728 contains the most characteristic specimen, though another retains rather more of the apex.

431. ?ALABA MUTANS, *nom. prov.*

A. t. ovoideâ, albâ; vertice parvo, declivi; anfr. ii. *sequentibus tumentibus, lævibus; dein anfractu uno minus tumente, superficie transversim minutissime rugulosâ, interdum costis obsoletis transversis; dein anfractibus normalibus* ii., *liris validis spiralibus cinctis, (in anfr. penult.* x.*) interstitiis rugulis minutissimis transversim ornatis, costis quoque transversis, pæne obsoletis, aperturam versus evanidis; basi rotundatâ; aperturâ ovali, ad basin effusâ; rimulâ umbilicali ornatâ; peritremati continuo; labro à lirulis indentato, labio tenui; columellâ haud plicatâ.*

The shell, in its disparity of whirls, and in the minute transverse rugulation of its surface resembles ?Chrysallida clausiliformis; in its ovoid form, the more typical Chrysallidæ; from which it differs in the entire absence of columellar plait, as an otherwise unfortunate breakage on the spire clearly proves. It may be a Rissoid, and resembles in many respects ?Litiopa saxicola, *C. B. Ad. Pan. Shells*, p. 183, no. 256, (which Dr. Gould assigns to Cingula, not having any columellar truncation, and on the labrum of which, in Mr. Cuming's specimens, there is no deposit, but a continuous peritreme, with an umbilical chink.) *Long.* ·088, *long. spir.* ·048, *lat.* ·046, *div.* 33°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1729 contains the specimen.

432. ?ALABA LAGUNCULA, *nom. prov.*

?A. t. elongatâ, albo-fuscâ; vertice tumentiore, declivi; anfr. iv. *primis lævibus, subplanatis, suturis canali parvâ, impressâ instructis, marginibus spiræ valde excurvatis; dein subito liris spiralibus validis, rotundatis, extantibus; interstitiis parvis, decussatis;* . . . . .

Tablet 1730 contains a fragment, intermediate in form between ?A. mutans and ?Chrysallida clausiliformis, remarkable for the sudden transition, after 4 whirls, from a perfectly smooth to a highly sculptured surface. The smooth part measures ·045 by ·023.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

433. ??ALABA ———, *sp. ind. (a.)*

Tablet 1731 contains a fragment of a somewhat large shell; the first four whirls swelling and smooth, like ?A. mutans; then with four whirls sculptured as in Chrysallida, with stout radiating ribs decussated with spiral striæ. ? May it however have belonged to a Nassa.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

434. ?ALABA ——— *sp. ind. (b.)*

Tablet 1732 contains a fragment of a strong shell, with smooth, prominent, strong, elongated tuberous portion, (the first whirls broken) followed by divergent, somewhat rounded whirls, cancellated as in Phos.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

FAMILY OVULIDÆ.

GENUS OVULA, *Brug.*

Enc. Meth. vol. xv. no. 37.—*Phil. Hand. Conch.* p. 162.
Amphiceras, *(Gronov.) Gray, Proc. Zool. Soc.* 1847, p. 143:—
=Amphiperas, *Morch.*
Volva *(Bolten) H. & A. Ad. Gen.* vol. i. p. 272.

435. OVULA VARIABILIS, *C. B. Ad.*

Ovula variabilis, *C. B. Ad. Pan. Shells*, pp. 31, 304, no. 4. (May, 1852.)
Ovula Californica, *Sow. Proc. Zool. Soc.* [teste Cuming: ? ubi.]

This shell closely resembles the Atlantic species, O. uniplicatum, *Sow.* (S. Carolina), O. aciculare, *Lam.* (W. Indies) and O. subrostratum, *Sow.* (Honduras). The striæ at each end are extremely fine, and are rarely traceable over the whole surface. The shape is sometimes stunted and broad, sometimes acumin-

ate. The colour varies from light buff to pink and dark violet purple, the latter prevailing. The posterior beak is broadly keeled outside. The largest sp. measures *long.* ·63, *lat.* ·23, *alt.* ·15.
A short sp. „ ·43, „ ·17, „ ·12.
A young, acuminate sp. „ ·38, „ ·11, „ ·07.

Hab.—Panama; rare, on Gorgonia (the various colours of which are imitated by the shell,) at low water mark of spring tides; *C. B. Adams.*—Mazatlan; rare; *L'pool. Col.*—San Juan, L. Cal., *Lieut. Green.*—Sta Barbara, *Col. Jewett.*

Tablet 1733 contains 8 sp. displaying the principal differences, kindly presented by J. Hibbert, Esq. of Liverpool.

Family CYPRÆIDÆ.

Genus CYPRÆA, *Linn.*

Cypræa, *Linn.* pars. Shell comparatively thin, cylindrical, faintly callous at the sides.

436. Cypræa exanthema, *Linn.*

Syst. Nat. ed. 12, p. 1172.—*Wood. Ind. Test.* pl. 16, f. 1.—*Dillw. Descr. Cat.* vol. i. p. 436, no. 1.—*Gray, Monogr. Cypr. Zool. Journ.* vol. i. p. 139:—*Descr. Cat.* p. 2, no. 7.—*Sow. Conch. Ill.* f. 170.—*Kien. Icon. Conch.* p. 71, no. 62, pl, 4, 5, (f. 1.) 9, 10, (f. 1.) 21, (f. 1.)—*Rve. Conch. Ic.* pl. 5, sp. 16.—*Lam. An. s. Vert.* vol. x. p. 489, no. 2.—(For other references, *v. Desh.* in loco.)

Jun. = Cypræa zebra. *Linn.* p. 3400, no. 8. et auct. antiq.

+ Cypræa cervinetta, *Kien. Icon. Conch.* p. 74, pl. 6, f. 1, 2.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 547, no. 71.—= C. exanthema, *Hinds, Voy. Sulph. Moll.* p. 6, (teste *C. B. Ad.*)—= C. exanthema, var. *a* & *b. Gray, Zool. Journ.* vol. i. p. 139.—= C. cervus, var. *Rve. Conch. Ic.* (teste *C. B. Ad.*)

Comp. Cypræa cervus, *Linn. Mant.* p. 548.—*Rve. Conch. Ic.* pl. 2, sp. 6.—= Cypræa cervina, *Lam.* loc. cit. no. 1.—*Gray*, p. 140.—*Sow.* f. 175.—*Kien.* pl. 2, 3.—*Rve. Conch. Syst.* vol. ii. p. 263, pl. 287, 288, f. 175.

The form C. cervinetta was distinguished by Kiener, who regarded it as from the W. Indies and Senegal; and was allowed with hesitation by Deshayes, who says that it is perhaps only an intermediate variety between the C. exanthema

and C. cervus of *Linn.* The species was adopted for geographical reasons by Prof. Adams, who regarded all the W. Indian shells as C. exanthema, all those from the W. coast as C. cervinetta, and all those from the Polynesian islands as C. cervus (=cervina). While however the S. W. Mexican shells belong clearly and exclusively to the type C. cervinetta, those from Mazatlan belong with almost equal exclusiveness to the typical C. exanthema. An examination of several hundred specimens shews that the characters usually relied on to separate the species, are by no means constant. The Mazatlan shells rarely develop inner dots; but the number of spots is extremely variable, one specimen exhibiting on the labral half the numerous small spots of C. cervus, on the labial half the distant ocellated spots of C. exanthema. The anterior dilation of the mouth is also variable, generally taking the open form of C. cervinetta, but sometimes the narrower shape of C. exanthema. The columellar indentation and markings are also variable. Sometimes the posterior labral deposit equals the labial, sometimes decidedly exceeds it, sometimes falls still more below it. The size is very rarely small as in C. cervinetta; generally elongated as in C. exanthema, occasionally large and swollen as in C. cervus. The colour is either light or dark; with the bands varying in distribution, and the mantle line generally straight, sometimes waved. A swollen adolescent specimen measures *long.* 3·44, *lat.* 2·04.
A cylindrical sp. „ 3·5, „ 1·66.

Hab.—W. Indies, passim.—Barbadoes, fossil, *Dr. Cutting.*—(C. cervinetta,) Panama and Taboga; 115 sp. at and just above low water mark of spring tides, under stones 15-20 in. in diameter; *C. B. Adams.*—S. W. Mexico, common,* *P. P. C.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 1734 contains 3 sp. adolescent, banded.—1735, 1 do. form cervus.—1736, 3 sp. spots beginning.—1737, 3 sp. adult, bands evident.—1738, 3 do. bands concealed.—1739, 3 sp. adult, light colour, spots very faint.—1740, 1 do. spots decided.—1741, 1 sp. slightly spotted, not banded, resembling C. talpa.—1742, 1 sp. right with few ocellated spots, left with close numerous simple ones.—1743, 2 sp. with ocellated spots; one small, type

* Before I was aware of the separation of C. exanthema and cervinetta, I unfortunately mixed some small specimens of the latter from the S. W. Mexican collection with those from Mazatlan, (the box from the latter having been temporally mislaid,) and distributed them accordingly. Those of the true C. cervinetta type were extremely rare in the Mazatlan collection.

cervinetta, spots small, numerous; the other richly coloured, approaching C. Scottii, with exanthemoid aperture, deeply scooped columella, large spots, labial teeth prominent to the nail.—1744, 3 sp. shewing variations in character of aperture, narrow to broad.—1745, 3 sp. shewing variations in posterior callosities, spire prominent or concealed.—1746, 1 sp. repaired after fracture.—1747, 1 sp. glossy outside, but with the blue interior most beautifully spangled with Spirorbis, Vermilia & Defrancia intricata.

Subgenus LUPONIA, *Gray*.

Zool. Journ. 1832, vol. i. p. 1:—*Proc. Zool. Soc.* 1847, p. 143.—*H. & A. Ad. Gen.* vol. i. p. 266. This group includes the Pyriform Cyprææ, (C. tigris, &c.)

437. Luponia ?spurca, *Linn.*

Cypræa spurca, *Syst. Nat.* ed. 12, p. 1179.—*Gray, Mon. Cypr. Zool. Journ.* vol. i. p. 501, no. 71.—*Sow. Conch. Ill.* sp. 51, f. 53, 81, 104.—*Kien. Icon. Conch.* p. 30, f. 1.—*Rve. Conch. Ic.* pl. 14, sp. 68.

=C. flaveola, *Lam. An. s. Vert.* vol. x. p. 525, no. 42, (non *Linn.*)
=C. acicularis, *Gmel.* p. 3421, no. 107.

This little shell may be a dwarf specimen of the Atlantic species (as the authorities have decided; in which case it is difficult to say how it got into the box of C. arabicula;) or it may be an allied Pacific form. It has rounded pits along the labral side, and a few at the top and bottom of the labial. One turn of the spire is seen. Colour resembling C. stercoraria on the back; orange brown at the sides; light brownish yellow in front. *Long.* ·84, *lat.* ·5, *alt.* ·39.

Hab.—(C. spurca) Mediterranean, auct.—Canaries, *M'Andrew.*—?Mazatlan; 1 small sp.; *L'pool Col.*

Tablet 1748 contains the specimen.

Subgenus ARICIA, *Gray*.

H. & A. Ad. Gen. vol. i. p. 265.—Shell greatly thickened at the sides, base flattened, back gibbous.

438. Aricia arabicula, *Lam.*

Cypræa arabicula, *Lam.* in *Ann. Mus.* vol. xvi. no. 54, p. 100:—*An. s. Vert.* vol. x. p. 534, no. 54.—*Gray, Zool. Journ.* vol. i.

p. 78 :—*Descr. Cat.* p. 3. no. 13.—*Wood, Ind. Test. Suppl.* pl. 3, f. 7.—*Val.* in. *Humb. Rec. Obs.* vol. ii. p. 334.—*Sow. Conch. Ill.* pl. 104, f. 77.—*Kien. Icon. Conch.* p. 125, pl. 28, f. 3.—*Rve. Conch. Icon.* pl. 13, f. 60.—*Mke.* in *Zeit. f. Mal.* 1851, p. 33, no. 112.—*C. B. Ad. Pan. Shells,* p. 32, no. 6.

Aricia arabicula, *H. & A. Ad. Gen.* i. 266.

? + Cypræa punctulata, *Gray, Zool. Journ.* vol. i. p. 387.—*Sow. Conch. Ill.* pl. 4, f. 20.—*Kien. Conch. Icon.* p. 114, pl. 21, f. 2.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 563, no. 92.—(Panama, with C. arabicula, *C. B. Adams.*)

This shell differs essentially from A. Arabica in the concealed spire, white teeth, and shape of the mouth and front, which have a general resemblance to A. caput-serpentis. The variation in tint and markings is considerable; some few diseased specimens even presenting the aspect of A. obvelata. A very large number were found, repaired after more or less severe fractures. The largest specimen measures *long.* 1·45, *lat.* 1·.

An elongated sp.	„	„ 1·17,	„ ·9.
A transverse sp.	„	„ 1·19,	„ ·75.
The smallest adult		„ ·84,	„ ·54.

Hab.—Acapulco, *Humboldt & Bonpland.*—St. Elena and Real Llejos, under stones, *Cuming.*—Panama; 7 sp. under stones from 8—20 in. in diameter, at and just below low water mark of neap tides; *C. B. Adams.*—S. W. Mexico, common; *P. P. C.*—Mazatlan; in extreme profusion; *L'pool & Havre Col.*

Tablet 1749 contains 4 sp. young and adolescent.—1750, 5 sp. dark, pattern indistinct.—1751, 5 do. distinct.—1752, 5 sp. small size, dark.—1753, 5 sp. lighter, very small.—1754, 5 sp. normal state.—1755, 5 sp. light, pattern distinct.—1756, 5 do. indistinct.—1757, 4 do. very light.*—1758, 3 do. with opaque whitish deposit.—1759, 1 sp. uniform greenish yellow, without spots.—1760, 5 sp. greenish, light markings.—1761, 5 do. dark, pattern distinct.

Specimens shewing sides. 1762, 5 sp. sides orange, panther pattern.—1763, 2 sp. with numerous spots and dots.—1764, 3 sp. spots large, few.—1765, 1 sp. spots small, numerous.—

* One of these appears to belong to the form C. punctulata: but the gradations between it and the typical C. arabicula are so numerous and gradual that I am unable to separate them. Mr. Gaskoin however, whose authority in this genus is paramount, regards the species as distinct.

1766, 3 sp. spots shaded.—1767, 3 sp. spots few.—1768, 5 sp. very callous.

Tablet 1769 contains 2 sp. with broad straight mantle mark.—1770, 5 sp. mantle mark irregularly waved.—1771, 3 sp. shewing changes in mouth.

Abnormal specimens. Tablet 1772 contains 5 sp. after slight fractures.—1773, 5 sp. somewhat deformed by fracture.—1774, 2 sp. twisted.—1775, 4 sp. after serious injury to labrum.—1776, 4 do. labium.—1777, 1 sp. which has bridged over the aperture ·22 in length, leaving a hole at the posterior canal.—1778, 3 sp. mantle irregularly injured.—1779, 4 sp. with large scar on the shoulder (not uncommon).—1780, 3 sp. with anterior scar, shewing violet layer.—These 120 specimens represent all the variations observed among many thousands.

Genus TRIVIA, *Gray.*

Zool. Journ. 1832, vol. i. p. 1 :—*Proc. Zool. Soc.* 1847, p. 142.
Shell small, front lirate, back with ribs or tubercles.
Cypræa, pars, auct.

439. Trivia pustulata, *Lam.*

Cypræa pustulata, *Lam. Ann. Mus.* vol. xvi. p. 101, no. 56 :—*An. s. Vert.* vol. x. p. 535, no. 56.—*Dillw. Descr. Cat.* p. 469, no. 66.—*Wood Ind. Test.* pl. 17, f. 63.—*Sow. Gen.* f. 5 :—*Conch. Ill.* pl. 102, f. 71.—*Gray Zool. Journ.* vol. i. p. 513.—*Kien. Icon. Conch.* p. 128, pl. 2, f. 3.—*Rve. Conch. Icon.* pl. 15, f. 76.—*Chénu Lec. Elem.* pl. 2, f. 11, 12.—*Mke* in *Zeit. f. Mal.* 1851, p. 33, no. 113.—*C. B. Ad. Pan. Shells,* no. 9, p. 35.

Trivia pustulata, *Gray Descr. Cat.* p. 16, no. 138.—*Pen. Cycl.* vol. viii. p. 257.

Pustularia pustulata, *H. & A. Ad. Gen.* i. 269.

This extremely beautiful species when young has much the form of Simnia (Ovula) patula, with the spire entirely concealed, and the surface most delicately cancellated as in Ficula. On turning-in its labrum, it first develops white facial ribs on a dark ground, afterwards the pustules on the back, finally those terminating the ribs. There often appears a white layer at the sides, in which case the lateral tubercles have generally a yellow tint; and always two ill-defined brown dashes, near

the top and bottom of the back. The pustules are almost always of a rich reddish orange, with a ring of dark at the base. The dorsal line is scarcely indented, but is free from pustules. The front ribs are often continued faintly over the sides. Shape oval or produced, with beaks more or less prominent. Labral teeth about 18; sometimes these are formed by principal ribs; sometimes by fainter intercalary ones, as in T. Solandri; sometimes there are marginal intercalations. Pustules very variable in number; two dwarf specimens have 94 and 176 respectively. Columellar excavation long and deep, bounded externally by a sharp rib. The smallest adult specimen measures *long.* ·51, *lat.* ·3, *alt.* ·21.

The largest do.	,,	·94,	,,	·6,	,, ·4.
A broad sp.	,,	·78,	,,	·56,	,, ·36.
An elongated sp.	,,	·76,	,,	·4,	,, ·34.

Hab.—Mexico, *Humboldt & Bonpland.*—Panama and Isl. Plata, [near Cape San Lorenzo, lat. 1·6°] under large stones, at extreme low water mark of spring tides only, rare; *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; *L'pool Col.*

Tablet 1781 contains 7 sp. in different stages of growth.—1782, 7 sp. white conspicuous.—1783, 7 sp. pustules few, large.—1784, 7 sp. usual state.—1785, 7 sp. pustules small, crowded.—1786, 3 sp. broad form.—1787, 3 do. elongated form.—1788, 2 sp. ashy tint, pustules scarcely bordered.—1789, 2 sp. shewing extremes of size.—1790, 2 dwarf sp. shewing extremes of shape and markings.

440. TRIVIA RADIANS, *Lam.*

Cypræa radians, *Lam. Ann. Mus.* vol. xvi. p. 102, no. 62:—*An. s. Vert.* vol. x. p. 540, no. 62.—*Gray Zool. Journ.* vol. iii. p. 364.—*Val.* in *Humb. Rec. Obs.* vol. ii. p. 335.—*Pot. & Mich. Moll. Mus. Douai,* vol. i. p. 485.—*Sow. Conch. Ill.* pl. 119, f. 146.—*Rve. Conch. Syst.* pl. 286, f. 146:—*Conch. Ic.* pl. , f. 117.—*Kien. Icon. Conch.* p. 129, pl. 23, f. 3.—*C. B. Ad. Pan. Shells,* p. 37, no. 10.

Cypræa oniscus, *Wood Ind. Test.* pl. 17, f. 58, (err. typ.)—Non C. oniscus, *Lam. An. s. Vert.* vol. x. p. 540, no. 63:—*Dillw. Descr. Cat.* p. 466, no. 61:—v. *Desh.* in loc.

Trivia radians, *Gray Descr. Cat.* p. 16, no. 137.

Most of the Mazatlan specimens were dead; but when fresh, it is of a brownish colour, with some of the lines interrupted

on the front surface.* Labral teeth 13—17, none intercalary. Shape variable, ovoid or oval; generally with thick callosity on each side, and flattened face. The largest normal specimen measures *long.* ·84, *lat.* ·64, *alt.* ·43.
A rounded sp. „ ·73, „ ·6, „ ·47.
An elongated sp. „ ·81, „ ·55, „ ·38.

Hab.—Acapulco, *Humboldt. & Bonpland.*—St. Elena, under stones, *Cuming.*—Panama, extremely rare, *C. B. Adams.*—Mazatlan; very rare living; *L'pool Col.*

Tablet 1791 contains 2 sp. adolescent, ribs forming; 1 adult, very fresh; 1 do. teeth close as in T. Solandri; and 1 sp. broken in two, shewing inner lips.—1792, the 3 sp. above measured.—1793, 3 sp. dwarf form, resembling T. Solandri.

441. Trivia Solandri, *Gray.*

Cypræa Solandri, *Sow. Conch. Ill.* no. 128, f. 43.—*Rve. Conch. Ic.* pl. 21, sp. 113.—*Mke.* in *Zeit. f. Mal.* 1847, p. 183, no. 30. Trivia Solandri, *H. & A. Ad. Gen.* i. 269.

Distinguished normally from T. radians by smaller size, redder colour, less swollen sides, rounder face with unbroken lines, greater excavation of the columella, and the presence of 2—4 intercalary teeth in the labrum,† the whole number varying from 15—18. An examination of at least 150 specimens of this species and T. radians has not confirmed the impression of distinctness which is given by extreme forms. The last is the only reliable character, and even that is varying; so that some specimens of T. radians have more teeth than others of T. Solandri. The arrangement of ribs in each form is too uncertain to found specific marks upon them. An examination of the animals, or at least of several hundred fresh specimens from different localities, appears needful to decide the point. The largest of the specimens, with only two intercalary teeth, measures *long.* ·63, *lat.* ·44, *alt.* ·35.
A rounded sp. „ ·54, „ ·39, „ ·29.
An elongated sp. „ ·65, „ ·36, „ ·28.

Hab.—Mazatlan; very rare; *L'pool Col.*

Tablet 1794 contains 2 sp. approaching the dwarf form of T. radians.—1795, 3 sp. normal state.

* *Desh.* erroneously states that each of the rays ends in a tubercle.

† Reeve states that there is "an intermediate tooth between each of those terminating the ribs." In the Mazatlan specimens, I have never seen more than 4, generally 2 or 3; these moreover are not teeth, but rudimentary ribs, continued for some little distance over the base.

442. TRIVIA SANGUINEA, *Gray*.

Descr. Cat. p. 14, no. 119.—*H. & A. Ad. Gen.* i. 269.
Cypræa sanguinea, *Sow. Cat. Cypr.* p. 12, no. 115:—*Conch. Ill.* pl. 6, no. 32.—*Lam. An. s. Vert.* vol. x. p. 570, 102.—*Rve. Conch. Ic.* pl. 23, f. 127.—*Chén. Lec. Elem.* pl. 10, f. 9, 10.—*Mke.* in *Zeit. f. Mal.* 1847, p. 183, no. 29:—1851, p. 34, no. 114.—*C. B. Ad. Pan. Shells*, p. 38, no. 12.
+ Cypræa fusca, *Gray* in *Sow. Conch. Ill.* no. 120, f. 37.—*Rve. Conch. Ic.* pl. 24, sp. 134.—*Mke.* in *Zeit. f. Mal.* 1851, p. 34, no. 115. (Galapagos & Bay of Guayaquil, *Cuming.*)
Comp. Cypræa rubescens,* *Gray, Proc. Zool. Soc.* 1832, p. 185.—*Rve. Conch. Ic.* pl. 25, sp. 141.—*C. B. Ad. Pan. Shells*, p. 38, no. 11. (Galapagos, *Cuming.*—Panama, *C. B. Adams.*)

After very careful and repeated examinations of many hundred specimens, I feel unable to separate the C. fusca from the C. sanguinea. The colour varies from very dark brownish purple, with blood-red stain on the back, to a brown with scarcely any admixture of purple or red; and again to a general reddish pink, like C. rubescens. The differences of shape, from a rounded form approaching T. subrostrata to an elongation approaching T. suffusa, do not accompany the differences of colour, but are found in each state. The swelling at the basal margins is very variable. The sculpture is by no means constant, the ribs (of uncertain number) being continuous over the back, or variously interrupted; intercalations and confluences frequently appearing. The columella is broadly indented over the whole length, with a wave in the middle.

The smallest sp. measures	*long.*	·27,	*lat.*	·21,	*alt.*	·17.
The largest sp.	„	„	·53,	„	·41,	„ ·31.
An elongated sp.	„	„	·47,	„	·33,	„ ·27.
A broad sp.	„	„	·36,	„	·28,	„ ·23.

Hab.—Panama and Mexico, Sowerby.—St. Elena, under stones, *Cuming.*—Panama, one dead sp. *C. B. Adams.*—Mazatlan; abundant, (generally dead;) *L'pool Col.*

Tablet 1796 contains 5 sp. dark brownish purple, red stain developed.—1797, 4 do. red scarcely appearing.—1798, 5 sp. dark brown, red stain slight.—1799, 4 do. red evanescent.—

* The specimens of T. fusca and T. rubescens in Mus. Cuming seem to be extreme varieties of T. sanguinea. Those in Mus. Gaskoin however appear distinct, especially of the form rubescens.

1800, 3 do. light brown, without red.—1801, 5 sp. light brownish purple, with red stain.—1802, 4 do. diffused purple red.—1803, 5 sp. diffused red.—1804, 4 sp. reddish pink.—1805, 4 sp. shewing changes of size.—1806, 5 sp. elongated form.—1807, 4 sp. broad.—1808, 4 sp. shewing variations in sculpture.—1809, 2 sp. distorted, and one broken open, shewing inner lip.—1810, 2 dead sp. with ribs very distant, having the aspect of T. radians. They may belong to T. Californica.

443. TRIVIA PULLA, *Gask.*

Cypræa pulla, *Gask.* in *Proc. Zool. Soc.* 1846, p. 24:—do. 1848, p. 97, no. 11.—(Non C. pulla, *Gmel.* = C. adusta, *Chem.*)

One specimen was found of this pretty little species. It is more elongated than T. subrostrata, with projecting beaks; the ribs interlocking alternately on the dorsal line; colour brownish purple; columellar indentation long and deep. *Long.* ·25, *lat.* ·17, *alt.* ·14.

Hab.—Galapagos Is. and Bay of Guayaquil; *Cuming.*—Mazatlan; 1 sp. with T. sanguinea; *L'pool Col.*

Tablet 1811 contains the sp.

444. TRIVIA SUBROSTRATA, *Gray.*

Zool. Journ. vol. iii. p. 363, (teste *Rve.*)

Cypræa subrostrata, *Sow. Conch. Ill.* p. 13, sp, 119, f. 36.—*Rve Conch. Ic.* pl. 26, sp. 147.—*Mke.* in *Zeit. f. Mal.* 1851, p. 34, no. 116.

Non Cypræa subrostrata, *Desh.* in *An. s. Vert.* vol. x. p. 581, no. 30, "fossile D'Orglande et de Nehou;.....coquille lisse et polie..... = *Gray, Monogr. Cypr. Zool. Journ.* vol. i. p. 369, no. 30:—*Descr. Cat. Shells*, p. 5, no. 36."

There appears to be a W. Indian species, so closely allied to this, that the figures quoted might apply to either. Dr. Gray however identified the solitary Mazatlan shell with the above name. The W. Indian shell (Bristol Mus.) is of a richer colour, with the beaks less rostrate, and the dorsal sinus deeper and broader. *Long.* ·25, *lat.* ·18, *alt.* ·16.

Hab.—Mazatlan; 1 dead sp.; *L'pool Col.*

Tablet 1812 contains the specimen.

Family CANCELLARIADÆ.

Genus CANCELLARIA, *Lam.*

445. Cancellaria urceolata, *Hinds.*

Proc. Zool. Soc. 1843, p. 47 :—*Voy. Sulph. Moll.* p. 41, no. 171, pl. 12, f. 7, 8.—*Sow. Thes. Conch.* p. 443, no. 13, pl. 94, f, 48.
Cancellaria obesa, *P. P. C. Cat. Prov.*; non *Sow.*
? = Cancellaria ovata, *Mke.* in *Zeit. f. Mal.* 1850, p. 181, no 51; non *Sow.*

The character by which Mr. Hinds distinguishes this species, that the nail is not obstructed when drawn in the direction of the axis, is by no means constant. There was considerable variation in about 50 specimens examined. Shell sometimes with spire depressed, resembling C. obesa; sometimes very prominent. Cancellations close and conspicuous on the early whirls, (the first 3 being smooth, deciduous,) afterwards very variable. Two sp. of nearly the same size have the ribs two to one. Spiral lines more or less expressed. The plaits have a slight callus below, near the termination of each, giving them in some positions a sub-bifid appearance. Sometimes there is a slight parietal tubercle. Labrum with 8-10 liræ inside. A young broad sp. measures *long.* ·77, *long. spir.* ·3, *lat.* ·52, *div.* 70°.

An elevated sp. „ 1·24, „ ·64, „ ·7, „ 50°.
The largest sp. „ 1·37, „ ·64, „ ·85, „ 60°.

Hab.—West Coast America, between 12·3° and 21·5° N. Lat: viz. Gulf of Papagayo, 8-14 fm.; San Blas, 7 fm. *Hinds.*—Mazatlan; very rare; *L'pool Col.*

Tablet 1813 contains 4 sp. exhibiting extremes of variation.

446. Cancellaria goniostoma, *Sow.*

Proc. Zool. Soc. 1832, p. 51 :—*Conch. Ill.* no 47, pl. 13, f. 43 :—*Thes. Conch.* p. 427, no. 64, pl. 94, f. 40.—*Müll. Syn. Nov. Test. Viv.* p. 73.—*Mke.* in *Zeit. f. Mal.* 1850, p. 181, no. 53.—*C. B. Ad. Pan. Shells*, p. 134, no. 157.
Comp. Cancellaria costata, *Gray, Sow. Thes. Conch.* sp. 60, p. 456, pl. 95, f. 60, 61; pl. 96, f. 103 : + C. rigida, *Sow.* (Gambia.)
Comp. C. brevis, *Sow. Conch. Ill.* f. 33 :—*Kien. Icon. Conch.* p. 14, no. 9, pl. 7. f. 2. (Patagonia, Kiener.)

Kiener thinks that to C. brevis should be united C. rigida and C. goniostoma; and certainly the species have a strong resemblance, as has also C. bicolor, *Hinds.* The Mazatlan shells, of which some hundreds have been examined, vary in the elevation of spire, in colour, sculpture, and in the angle of the aperture. Sometimes the labium is parallel to the axis, sometimes at an angle of nearly 30°. Sometimes the ribs are sharp, distant, and scarcely nodulous; sometimes running into each other, with strong tubercles. Sometimes the shell is nearly white, sometimes of a rich purple brown, or brown orange. The first two whirls are smooth, followed by one which is finely cancellated, not shouldered. The umbilicus varies in size, and is more or less sculptured. The largest specimen measures *long.* 1·04, *long. spir.* ·54, *lat.* ·78. *div.* 80°.
A slender sp. „ 1·04, „ ·6, „ ·75, „ 70°.
A broad sp. „ ·8, „ ·37, „ ·64, „ 90°.

Hab.—Conchagua, San Salvador; on sandy bottom, 8 fm.; *Cuming.*—Taboga; 1 sp. *C. B. Adams.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 1814 contains 3 young sp.—1815, 3 sp. ordinary broad growth.—1816, 2 sp. acuminated.—1817, the largest sp. with the aperture only touching the penultimate whirl at the basal keel.—1818, 3 sp. shewing variations in colour.—1819, 2 sp. ribs distant.—1820, 2 do. close.

Family STROMBIDÆ.

Genus STROMBUS, *Linn.*

447. Strombus galeatus, *Swains.*

Phil. Mag. & Journ. 1823, p. 401.—*Gray Descr. Cat.* p. 2, no. 2.—*Sow. Thes. Conch.* p. 36, no. 54, pl. 10, f. 114.—*Kien. Conch. Ic.* p. 5, pl. 2—*Lam. An. s. Vert.* vol. ix. p. 710, no. 33.—*Ducl.* in *Chèn. Ill. Conch.* pl. 26, 27, f. 1.—*Kust. Conch. Cab.* p. 13, no 5, pl. 4 *a*, f. 1, pl. 4 *b*, f. 1, 2.—*Rve. Conch. Ic.* pl. 3, sp. 3, f. 3.—*Mke.* in *Zeit. f. Mal.* 1851, p. 20, no. 92.
Strombus galea, *Wood, Ind. Test. Suppl* 1828, p. 14.—pl. 4, f. 13, 14.—*C. B. Ad. Pan. Shells,* p. 111, no. 122.
Strombus crenatus, *Sow. Tank. Cat.* 1825, App. p. xix.

This fine and graceful species appears to replace S. gigas on the W. coast of N. America, as S. Peruvianus does on the Pacific shores of S. America. When very young, the spire is fusiform, with spiral striæ and transverse folds as in Fusidæ (Colidæ, *Gray.*) Gradually the whirls lose their sculpture, and envelop each other, with a broad channel below the suture and an obtuse angle near the periphery. Beneath this are developed more or less faint obtuse spiral ribs, ending in slight crenations of the but-moderately expanded outer lip. Posterior channel narrow, ascending the spire. Epidermis deciduous, nearly smooth. Menke has described the operculum as like that of S. gigas, lancet-shaped, slantingly elliptical, with a keel-shaped line near the middle. It is figured in *H. & A. Ad. Gen.* i. pl. 27, f. 1*a*. 1*b*. The entire stock of this beautiful shell in the L'pool Col. shared the fate of the Spondyli and large limpets. The specimens here displayed are from the Havre Col. *Long.* 8·5, *long. spir.* 1·2, *lat.* 6·3, *div.* 90°.

Hab.—Gulf of Nicoya, on reefs at low water, *Cuming*=Taboga (fragments) *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 1821 contains a young specimen, in perfect condition, 6·5 in length.—1822, a fine adult specimen.

448. STROMBUS GRANULATUS, *Swains.*

Bligh Cat. App. p. 8.—*Wood Ind. Test. Suppl.* pl. 4, f. 21.—*Swains.* in *Hanl. Exot. Conch.* p. 36.—*Sow. Thes. Conch.* p. 33, no. 39, pl. 9, f. 100.—*Kien. Icon. Conch.* p. 28, pl. 22, f. 1.—*Lam. An. s. Vert.* vol. ix. p. 713, no. 37.—*Ducl.* in *Chen. Ill. Conch.* pl. 11, f. 5. 6.—*Kust. Conch. Cab.* p. 64, pl. 13, f. 13.—*Rve. Conch. Ic.* pl. 14, f. 32.—*C. B. Ad. Pan. Shells*, p. 113, no. 124.—*Mke.* in *Zeit. f. Mal.* 1851, p. 21, no. 93.

This well-known species appears to abound in the warmer latitudes, but not to flourish at Mazatlan. It is easily recognized by its elevated spire, very stout nodules, and variegated painting. Epidermis rather rough, adherent. *Long.* 3·44, *long. spir.* ·96, *lat.* 1·64, *div.* 50°.

Hab.—St. Elena and Galapagos; sandy mud, 6-8 fm.; *Cuming.*—Panama, *Col. Jewett.*—Taboga, 7 dead sp. *C. B. Adams.*—

S. W. Mexico, common, *P. P. C.*—La Paz, *Lieut. Green.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1823 contains a fine specimen, mended after repeated fractures, with Vermetus and attachment of Crepidula onyx.

Tablet 1824 contains a minute white transparent shell, (off Spondylus;) smooth below, angulated above, with linear aperture; which may possibly prove to be the young of this species.

449. STROMBUS GRACILIOR, *Sow.*

Tank. Cat. no. 1792, p. xx.—*Wood, Ind. Test. Suppl.* pl. 4, f. 1.—*Sow. Thes. Conch.* p. 32, no. 35, pl. 8, f. 73.—*Kien. Icon. Conch.* p. 31, pl. 21, f. 1.—*Lam. An. s. Vert.* vol. ix. p. 713, no. 36.—*Ducl.* in *Chèn. Ill. Conch.* pl. 17, f. 6, 7.—*Kust. Conch. Cab.* p. 36, pl. 4 *a*, f. 6, 7.—*Rve. Conch. Icon.* pl. 16, f. 38.—*Mke.* in *Zeit. f. Mal.* 1851, p. 22, no. 95.—*C. B. Ad. Pan. Shells*, 112, no. 123.

Known from its Caribbæan analogue, S. pugilis, not only by its more slender outline, the faint development of the tubercles, obsolete on the last whirl, and the preponderance of yellow over red in the tint; but by the epidermis, which is soft to the feel, very finely striated, adherent, and generally stained green by vegetable incrustations. A wholesale dealer in boxes of the W. Indian shell, states that this is a constant character of difference. Almost all the specimens had been repaired after more or less severe fractures. The shell varies in the amount of elevation of the spire. The first whirls have close radiating ribs instead of tubercles, crossed by spiral striæ. An adolescent sp. measures *long.* 3·24, *long. spir.* 1·38, *lat.* 1·74, *div.* 60°.

An adult sp. „ 3·17, „ ·84, „ 2·05, „ 70°.

Hab.—St. Elena and Panama; sandy mud, 6—10 fm.; *Cuming.*—Taboga; 1 dead sp. *C. B. Adams.*—Taheite, Jay.[?]—La Paz, *Lieut. Green.*—Mazatlan; very rare; *L'pool Col.*

Tablet 1825 contains an adolescent, and an adult sp.—1826, 1 sp. mouth darkly stained.—1827, 1 sp. labrum renewed after severe fracture.

Suborder TOXIFERA.

Family TEREBRIDÆ.

Genus TEREBRA, *Adanson.*

Terebra, *Adans.* pars.—Eyes at the outer bases of the tentacles.

Subgenus MYURELLA, *Hinds.*

H. & A. Ad. Gen. vol. i. p. 227.—Whirls with a tuberculated zone.

450. Myurella albocincta, *n. s.*

M. t. conico-subulatâ, acuminatâ, turritâ ; fusco-purpureâ seu olivaceâ ; anfr. planulatis, superne cingulo tuberculato, albo, interruptè fusco picto ; infra costis transversis, tuberculis haud semper convenientibus, haud extantibus, obtusis ; lineis impressis spiralibus, plerumque IV.—VI., *interdum costis decussantibus ; superficie totâ spiraliter exillime striatâ, striis undulatis, irregularibus ; anfr. ultimo cingulo albido suturæ antecedente ; aperturâ obovali, labro acuto, vix sinuato, labio tenuissimo ; canali brevi, contortâ, alte emarginatâ ; carinâ acutâ spiraliter ascendente, columellam vix plicante : operc. parvo, diaphano, aureo, rhombico, diagonaliter depresso, apice acuto, marginibus rectis, termino convexo.*

=Terebra armillata, *Mke.* in *Zeit. f. Mal.* 1851, p. 34, no. 118, (non *Hinds.*)

Comp. T. variegata, *Mke.* loc. cit. no. 117, (?non *Gray.*)

Following as I thought the judgment of Dr. Menke, I have freely distributed this shell as T. variegata. According to the types however, that species is distinct; it is not uncommon on the coast, but was entirely absent from the Mazatlan collection. The shell so named in Dr. Menke's mixed list may be the true T. variegata, imported, or one of the species now described. The present species is so closely related to T. armillata, *Hinds*, (teste types in Mus. Cum.) that there can scarcely be a doubt that it is the shell brought by Melchers. It even more closely resembles the Gambia species, T. intertincta, *Hinds*;* from

* ? Should not T. Africana, *Gray*, in *Griff. Cuv.* pl. 23, *f. 5*, be referred to this species rather than to T. variegata. The shell figured by *Kien. Icon. Conch.* p. 114, no. 10, pl. 2, f. 3, seems exactly to represent the T. variegata of the Gulf of California; which differs from T. albocincta in being much larger, broader, not olivaceous, with sutural band broader and flatter in proportion, with the radiating costæ in the lower whirls nearly obsolete, and the base more rounded.

which however it is distinguished by the absence of the lower row of tubercles. There are about 16 whirls, of which the first three are smooth, brown and translucent; while the next three (about) display the costæ without the spiral groove. The young shell is very dark coloured, with the ribs conspicuous; the girdle gradually develops its white colour, and afterwards very irregular reddish-brown spots. The costæ gradually become fainter and more irregular, and are or are not decussated by the spiral lines. These are normally 4--6, but variable. The whole surface is covered with microscopic spiral striulæ, irregularly waved, giving a rugose appearance. The sutural line is continued round the base in a faint white band. The deeply cut notch is bounded by a sharp keel externally, which runs round over the columella. The colour is almost always purplish brown, shading into olivaceous brown, more or less dark, lustrous. Operculum rhomboidal, more angular than in Pleurotoma, apex at the end of the long diagonal, expanding with straight sides and a scarcely rounded end. Most of the opercula found are abnormal, mended as from a subcentral nucleus. These beautiful shells are often encrusted with black mud, as in Drillia luctuosa, and have frequently been obliged to repair breakages at their extremity. The largest sp., unusually slender, measures *long.* 1·6, *long. spir.* 1·2, *lat.* ·34, *div.* 13°.
A young broad sp. „ 1·06, „ ·74, „ ·28, „ 19°.

Hab.—Mazatlan; not common; *L'pool Col.*

Tablet 1828 contains 5 sp. usual colour.—1829, 5 sp. richly olivaceous.—1830, 3 sp. purplish brown predominating.—1831, 1 sp. ashy tint, markings faint.—1832, 2 sp. markings very faint.—1833, 3 do. markings very strong.—1834, 3 sp. repaired after simple and compound fractures.—1835, 1 sp. with operculum in situ; and 2 separate opercula, one normal, the other mended after fracture.

451. MYURELLA HINDSII, *? n. s.*

M. t. "*M. albocinctæ*" *simili, sed graciliori; anfr. confertioribus; omnino albidâ, rufo-fusco vix tinctâ; cingulo aream majorem occupante, tuberculis validis; costis evanidis; lineis spiralibus* iii.-v., *striulis haud apparentibus; plicâ columellari haud conspicuâ.*

A very few specimens were found of a whitish colour, faintly spotted with reddish brown; with the ribs scarcely apparent, and the general surface smooth. Whether the form be of

specific or only of sectional value (as will be learnt by induction from more numerous specimens,) it bears the honoured name of the author of the Synopsis of this genus in the *Proc. Zool. Soc.* 1843, pp. 159 et seq. *Long.* 1·24, *long. spir.* ·98, *lat.* ·27, *div.* 13°.

Hab.—Mazatlan; 6 specimens, dead; *L'pool Col.*

Tablet 1836 contains 2 specimens, with extremes of sculpture.

452. MYURELLA SUBNODOSA, *? n. s.*

M. t. "*M. albocinctæ*" *formâ et indole simili; sed rufo-fuscâ, albido tinctâ; sublævi, lirulis radiantibus et striulis extantibus paucis spiralibus vix ornatâ; superficie haud striatâ; peripheriâ subangulatâ, subnodosâ; columellâ carinâ vix extante, haud plicatâ.*

Two specimens were found, agreeing in shape exactly with T. albocincta, but with the faint spiral sculpture raised instead of indented, the surface destitute of microscopic striulæ, the periphery subnodulous, and the keel surmounting the canal very faint. *Long.* 1·22, *long. spir.* 1·, *lat.* ·36, *div.* 18°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1837 contains the large specimen, with the spire bent through fracture.

453. MYURELLA RUFOCINEREA, *? n. s.*

M. t. "*M. Hindsii*" *formâ et indole simili; sed omnino rufo-cinereâ, haud maculatâ; cingulo latiore, pallidiore, margine impresso, tuberculos confertiores angustos, magis elongatos gerente; costis radiantibus acutis expressis, tuberculis lineis vix undatis convenientibus; fasciâ circa peripheriam valde rotundatam pallidiore; columellâ à carinâ super canalem plicatâ; anfractibus subconvexis, lineis spiralibus, haud sculpturâ microscopicâ, ornatis.*

In shape agreeing with M. Hindsii; but with markings more like those of M. albocincta, yet destitute of minute sculpture; with the costæ much more developed, and the sublinear tubercles in a less waved line of junction. The cincture is marked off by a deep suture. This, and the more rapid rounding of the base, give the whirls a slightly convex appearance. One fresh, beautifully tinted specimen was found; and a spiral

portion which probably belongs to this species, though it appears more slender. *Long.* 1·22, *long. spir.* ·96, *lat.* ·25, *div.* 13°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1838 contains the shell and the spiral fragment.

Genus SUBULA, *Schum.*

Subula, *Schum. Ess.* 1817, pars.—Distinguished by having the eyes on the tips of the tentacles, instead of on their outer bases; in the shell, by the absence of the spiral band, sinuated lip and canal.

Acus *(Humph.) Gray*, 1847, *Proc. Zool. Soc.* 1847, p. 139.—*H. & A. Ad. Gen.* vol. i. p. 224.—Comp. *Gray, Gen. Moll.* 1856.

Terebra (pars) *auct.*

454. Subula luctuosa, *Hinds.*

Terebra luctuosa, *Proc. Zool. Soc.* 1843, p. 157.—*Hinds* in *Sow. Thes. Conch.* p. 181, no. 89, pl. 45, f. 121.—*Menke* in *Zeit. f. Mal.* 1851, p. 34, no. 119.

Hastula (Acus) luctuosa, *H. & A. Ad. Gen.* i. 225.

Shell nearly related to S. cinerea and S. strigilata from the E. Indies. Lustrous, with extremely fine, crowded spiral striæ, generally consisting of minute dots; and very numerous, fine, slightly waved, sharp ribs on the upper part of the whirls, evanescent in the middle. Between these are often extremely minute radiating striulæ. About 6 of the first whirls are translucent and without ribs. Apex submamillary. First normal whirls with ribs strong. Outline very acuminate and nearly rectilinear. The outer lip when perfect, which it rarely is, is gracefully sinuated posteriorly in the direction of the ribs. About half the specimens are of an ashy or olivaceous brown; the remainder of a lustrous brown black, often fading into light blue; with scarcely any intermediate shades. Highly coloured specimens are sometimes found of a very dark olive green, with a row of infrasutural spots of purplish brown, sometimes over a yellowish green ground, occasionally confluent. The operculum is small, thin, horny, ovate, with faint waves of growth: its apex is terminal. The largest of the specimens, (making allowance for the tip which is broken off,) measures *long.* 1·84, *long. spir.* 1·4, *lat.* ·33, *div.* 12°.

A broad sp.	„	1·62,	„	1·18,	„	·34,	„ 14°.
An attenuated sp.	„	1·37,	„	1·03,	„	·26,	„ 11°.

Hab.—Gulf of Nicoya ; Puerto Portrero ; in 12 fm. coral sand ; *Cuming, Hinds.*—Mazatlan ; *Menke.*—Do. ; common ; *L'pool Col.*

Tablet 1839 contains 6 sp. different ages, olivaceous ashy tint.—1840, 6 sp. rich olive.—1841, 3 sp. tint changing.—1842, 2 sp. black brown.—1843, 5 sp. black fading into blue.—1844, 5 sp. dark lustrous shade.—1845, 1 sp. olivaceous, spire interrupted by breakage.—1846, 2 sp. dark, spire deformed, do.—1847, 2 sp. with opercula, one in situ, the other loose.

Subgenus EURYTA, *H. & A. Ad.*

Gen. vol. i. p. 225.—Shell with a false umbilicus, caused by the twisting of the columella.
Buccinum, pars, *Lam.*

455. Euryta fulgurata, *Phil.*

Phil. in *Zeit. f. Mal.* 1846, p. 53, no. 23.—*Menke* in do. (diagn. emend.) 1847, p. 181, no. 14.
Euryta fulgurata, *H. & A. Ad. Gen.* i. 225.
=Terebra arguta, *Gould, Mex. & Cal. Shells*, p. 7, pl. 14, f. 19.

Shell very small, slender, with a variable number (12—18 in each whirl, *Mke.*) of fine sharp ribs (not nodose) often running in lines from the apex to the base ; interspaces elegantly undulated, shining and smooth except near the base where there are some very fine spiral striæ. Mouth rather elongate, lip not undulated, base strongly notched, displaying the false umbilicus. Colour extremely variable ; generally of a very light brownish tinge, elegantly penciled with reddish brown in irregular undulated markings, and a brown spiral line bordering the notch ; often without pencilings, of a uniform white, orange, or brownish purple, or with a light or dark band near the suture ; very frequently changing in pattern and colour at different ages. The first three whirls are smooth, and with the rest are slightly convex ; suture distinct. Spire very frequently covered with nearly round egg cases. *Long.* ·74, *long. spir.* ·46, *lat.* ·2, *div.* 23°.

Hab.—Mazatlan, *Philippi.*—Do. *Melchers*, Menke.—Do. ; common, *L'pool Col.**

* Two shells in the British Museum from E. Africa, *Capt. Owen*, marked "T. aciculata, *Gray*," do not display any characters by which they can be separated specifically.

Tablet 1848 contains 5 sp. pure white.—1849, 4 do. French white.—1850, 5 do flesh colour.—1851, 4 do. orange.—1852, 5 do. orange brown, banded with light.—1853, 4 do. light orange, do.—1854, 1 sp. orange banded with light slate.—1855, 1 do. with purple.—1856, 5 do. orange brown banded with white, faintly penciled.—1857, 4 do. yellow banded with slate and white.—1858, 5 do. slightly penciled.—1859, 4 do. dark.

Tablet 1860 contains 6 sp. purple slate, banded with white.—1861, 5 do. with orange tinge.—1862, 4 do. brownish purple.—1863, 5 sp. nearly uniform slate.—1864, 4 do. brown slate with white band.—1865, 5 do. darker.—1866, 6 do. with last whirl light, penciled.

Tablet 1867 contains 4 sp. white with slate band.—1868, 6 do. faintly penciled.—1869, 5 do. more penciled.—1870, 5 sp. highly penciled.

Tablet 1871 contains 5 sp. colours blended, penciled.—1872, 3 sp. penciling dotted.—1873, 4 do. penciling faint.—1874, 5 do. finely zigzag.—1875, 5 do. more distinct.—1876, 4 do. distant waves.—1877, 4 do. highly developed.—In all 132 sp. of which each one perceptibly differs from the rest.

456. Euryta aciculata, *Lam.*

?Buccinum aciculatum, *Lam. An. s. Vert.* vol. x. p. 175, no. 41.
Terebra aciculata, *Gray* in *Proc. Zool. Soc.* 1834, p. 63.—*Hinds* in do. 1843, p. 166, no. 104.—*Hinds* in *Sow. Thes. Conch.* p. 183, no. 99, pl. 45, f. 104.
Euryta aciculata, *H. & A. Ad.* loc. cit.

Two dead specimens alone of this shell were found by Mr. Darbishire with Euryta fulgurata; distinguished by long nodulous plaits at the upper portion of the whirl, in the last whirl slightly divided into two. Colour yellowish white with a brown spiral band on the nodulous portion, and a reddish band on the base. It does not agree with specimens received under the same name from the Bristol Museum, probably from the West Indies.* These are nearly related to A. Cosentini, *Phil.* from Naples. Menke considers them identical, *Zeit. f. Mal.* 1847,

* "Our information of the W. Indian species is most barren," *Hinds* in *Thes.* p. 149. ? Is the Lamarckian shell the W. Indian species, and that from Acapulco distinct. Care must be taken not to confound it with Lamarck's Terebra aciculina (*An. s. Vert.* vol. x. p. 250, no. 22) which is Buc. cinereum of *Born*, (v. *Desh.* in loc.) and Terebra cinerea of *Thes. Conch.* p. 180, no. 87:—*P. Z. S.* 1843, p. 165, no. 93.

p. 181, but Hinds points out differences, *Thes. Conch.* p. 184. *Long.* ·5, *long. spir.* ·32, *lat.* ·16, *div.* 30°.

Hab.—Acapulco, Sonsonati; Mus. Cuming.—Xipixapi, *Cuming.*—Mazatlan; extemely rare; *L'pool Col.*

Tablet 1878 contains 1 specimen, presented by R. D. Darbishire, Esq.

Family PLEUROTOMIDÆ.

All the young Pleurotomidæ examined have the apex normal, with about three whirls smooth and subtransparent. The opercula in this Suborder, as in Proboscidifera, are very frequently repaired after fracture.* Whatever be their normal condition, they always reconstruct from a central nucleus: a circumstance which seems to shew that the variations in opercula are not of so much importance as in the shells; the latter being almost always repaired after the normal pattern.

Genus PLEUROTOMA, *Lam.*

Journ. Hist. Nat. 1799, pars : canal elongated, operculum subtriangular, nucleus at the anterior extremity.

Turris, *(Humph.) Gray, Proc. Zool. Soc.* 1847, p. 134.—*H. & Ad. Gen.* vol. i. p. 87. (Non *Montf.*)

457. Pleurotoma funiculata, *Val.*

Kien. Icon. Conch. p. 24, no. 18, pl. 16, f. 1.—*Rve. Conch. Ic.* pl. 11, sp. 95.

=P. olivacea, var. *Rve.* loc. cit. (a prim. man.) pl. 4, sp. 27; non *Sow. Proc. Zool. Soc.* 1833, p. 136.

Surcula (Turris) funiculata, *H. & A. Ad. Gen.* i. 88.

The aspect of the Mazatlan shells is intermediate between the figures of *Kien.* and *Rve.* They differ from the figure of P. olivacea in the widely excavated space of the posterior sinus, and in the keeling of the whirls below it. The epidermis in the young shells is ashy, in the adult of a rich glossy olive. There are numerous coarse spiral striæ, two of which appear above the suture. There are about 10 nearly obsolete costæ, rising into tubercles at the periphery. Nuclear whirls smooth.

* V. *Gray* on Reproduction of Opercula, *Ann. Nat. Hist.* 1854, p. 419.

The shells (of which I have examined about 100) scarcely vary, except slightly in acumination. The operculum is formed like an obtuse-angled triangle, with the base along the columella, nucleus near the canal, the other angles rounded; reddish olive, strong, outside nearly smooth, with the base raised; muscular scar deeply marked, but not corrugated. The youngest sp. is 1·1 long; the largest (allowing for the decollation of the spire) measures *long.* 2·48, *long. spir.* 1·34, *lat.* 1·, *div.* 40°.

Hab.—San Blas, *Kiener.*—Gulf of California; in sandy mud; *Lieut. Babb.*—S. W. Mexico; *P. P. C.*—Mazatlan; rare, in fine sand; *L'pool Col.*—(The localities "Gulf Nicoya and W. Coast Mexico, *Hinds,*" assigned to P. olivacea + funiculata by Reeve, probably belong to this species.)

Tablet 1879 contains 3 sp. different ages, of which one has the operculum in situ.—1880, the largest sp. with its operculum, mended after fracture; the original part is from a terminal nucleus, the new third from a central one. The shell has twisted its canal till it is ·56 broad, forming a broad false umbilicus. Also a sp. incrusted, and with the canal destroyed by sponge; yet with the operculum in situ.—1881, 2 opercula, one normal, the other with a subcentral nucleus.

458. PLEUROTOMA MACULOSA, *Sow.*

Proc. Zool. Soc. 1833, p. 135.—*Rve. Conch. Syst.* vol. ii. pl. 233, f. 8:—*Conch. Ic.* pl. 6, sp. 45.—*Mke.* in *Zeit. f. Mal.* 1851, p. 19, no. 89.—(Non P. maculata, *C. B. Ad. Contr. Conch.* no. 4, p. 62. Jamaica.)

Drillia maculosa, *H. & A. Ad. Gen.* i. 90.

Shell very constant in form; thin, slender; of an ashy colour, more or less spotted or stained with reddish brown; markings sometimes fine, sometimes in large dashes, sometimes almost wholly absent. Epidermis very thin, smooth, not glossy. First three whirls smooth; the rest with one row of stout tubercles along the spire, which are rarely coloured; the whole surface very finely spirally striated. Canal open, too long to rank satisfactorily with Drillia; labrum smooth, sharp; posterior sinus large, deep; anterior slight, open. Operculum closely resembling that of Pl. funiculata, but longer in proportion, with the inner margin scarcely raised. About one in five of the opercula found were abnormal, with the nucleus central. The smallest sp. of 11 whirls, measures ·68; the largest, (with 15 whirls,) *long.* 1·96, *long. spir.* 1·13, *lat.* ·57, *div.* 25°.

Hab.—W. Columbia; in sandy mud, 16 fm.: *Cuming.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 1882 contains 8 sp. different ages and markings.—1883, 3 do. colour scarcely developed.—1884, 4 sp. rather more slender.—1885, 4 sp. mended after fracture, (one with a fresh, separate canal.)—1886, 3 do. spire bent.—1887, 1 sp. pierced by a Proboscidifer.—Six of the above sp. have the normal opercula in situ; tablet 1888 contains 2 sp. with abnormal opercula in situ, and one normal operculum separate.

Genus DRILLIA, *Gray.*

Fig. Moll. An. p. 73, no. 3.—*H. & A. Ad. Gen.* vol. i. p. 89.
Clavatula, pars, *Lam.* The operculum is Purpuroid in Clavatula, Pleurotomoid in Drillia. Canal very short. The group is remarkable, among marine shells, for the number of black species.

459. Drillia incrassata, *Sow.*

Pleurotoma incrassata, *Sow. Proc. Zool. Soc.* 1833, p. 138.—*Müll. Syn. Nov. Test. Viv.* p. 115.—*Rve. Conch. Ic.* pl. 9, f. 76.—*Mke.* in *Zeit. f. Mal.* 1851, p. 19, no. 90.—*C. B. Ad. Pan. Shells*, p. 144, no. 175.
Crassispira (Drillia) incrassata, *H. & A. Ad. Gen.* i. 91.
Pleurotoma Bottæ, *Kien. Icon. Conch.* p. 33, no. 26, pl. 15, f. 2.

The solitary Mazatlan specimen differs from Kiener's figure of M. Botta's supposed unique shell, in being quite black, with the labrum serrated, sharp, and incurved at the edge, then very much thickened (·18 in.); behind very thin, nearly transparent. Posterior callosity distinct. The aspect of the shell is like a very large D. luctuosa, with very fine granulose radiating lines, about 18 in a whirl. A closely analogous form from the W. Indies, is probably the D. gibbosa, *Chem.* elegantly figured by *Kien. Icon. Conch.* pl. 16, f. 2. as his own species; the error being corrected by *Rve.* sp. 30. *Long.* 1·64, *long. spir.* ·83, *lat.* ·68, *div.* 30°.

Hab.—Panama and Monte Christi; in sandy mud 6—10 fm.; *Cuming.*—Panama, 1 sp. *C. B. Adams.*—Mazatlan, *Botta*:—do.; 1 fresh sp.; *L'pool Col.*

Tablet 1889 contains the specimen.

460. DRILLIA RUDIS, *Sow.*

Pleurotoma rudis, *Sow. Proc. Zool. Soc.* 1833, p. 134.—*Müll. Syn. Nov. Test. Viv.* p. 109.—*Rve. Conch. Ic.* pl. 7, sp. 53.—*C. B. Ad. Pan. Shells*, p. 146, no. 181.

Crassispira (Drillia) rudis, *H. & A. Ad. Gen.* i. 91.

Comp. P. excentrica, *Sow.* loc. cit.—*Rve.* loc. cit. sp. 58.—(Drillia e.) *H. & A. Ad. Gen.* i. 90.

In a genus, the discrimination of whose species rests on minute details of sculpture, the figures in the *Conch. Ic.* are of but little help. The two shells from the Mazatlan boxes, with others obtained from a shop, probably from the same collection, agree in some points with each species, but are referred to D. rudis by Mr. Cuming. They are of a dull black, without white spots, with the upper keel nodulous in the upper whirls, a row of costal tubercles abnormally shewing at the suture, with spiral lines faintly nodulous below; the whole surface minutely spirally striulated, more coarsely in the region of the notch; the last whirl descending and then rising, making the axis excentric; aperture ending in a notch with a very stout callosity rising above: labrum thin, slightly incurved and serrated, with a strong rib behind; labium distinct. *Long.* 1·1, *long. spir.* ·6, *lat.* ·48, *div.* (upper whirls) 48°.

Hab.—Monte Christi; under stones; *Cuming.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1890 contains one specimen.

461. DRILLIA ATERRIMA, *Sow.* var. MELCHERSI.

Pleurotoma aterrima, *Sow. Proc. Zool. Soc.* 1833, p. 137.—*Müll. Syn. Nov. Test. Viv.* p. 113.—*Rve. Conch. Ic.* pl. 12, sp. 100.—*C. B. Ad. Pan. Shells*, p. 138, no. 163.

Crassispira (Drillia) aterrima, *H. & A. Ad. Gen.* i. 90.

? = Pl. maura, *Val.* in *Kien. Icon. Conch.* p. 59, no. 37, pl. 23, f. 1. (non *Sow.*)

= Pl. Melchersi, *Mke.* in *Zeit. f. Mal.* 1851, p. 20, no. 91.

? + Pleurotoma discors, *Sow. Proc. Zool. Soc.* 1833, p. 137.—*Müll. Syn. Nov. Test. Viv.* p. 113.—*Rve. Conch. Syst.* pl. 235, f. 14:—*Conch. Ic.* pl. 6, f. 38.

Var. ? = Pl. atrior, *C. B. Ad. Pan. Shells*, no. 164, pp. 138, 308.
= Pleurotoma rustica, *P. P. C. Cat. Prov.*, non *Sow.*

It is fortunate if Kiener's species, described from a specimen brought from Mazatlan by M. Botta, is not needed, as the

name was pre-occupied by *Sow.* The inaccuracy of the figure in the *Conch. Ic.* and the variation in the number of spiral tubercular striæ (in this species not a constant character,) excuse Menke for having redescribed it. The P. atrior of Prof. Adams, described from a single specimen, appears to be characterized by the pale spiral stripe; which, though rarely conspicuous, and not noticed in the diagnosis of the species, may generally be seen inside the mouth, by holding the shell up to the light; and in fine specimens is often clearly discernible on the last whirl. The P. discors scarcely differs in essential characters, though it is a much larger form. Shell with the entire surface very minutely spirally striated; with a prominent keel near but not close to the suture, which partially covers the principal row of nodules, 12—14. Below are several spiral lirulæ of which generally two, sometimes more, are prominent and granular, the granules corresponding with the tubercles above. Sinus rather narrow and deep, in the middle of a large excavated area; with the thick posterior callosity labral rather than parietal. A narrow horn-coloured band, sub-transparent, runs just above the tubercles; (in one specimen broad, covering the tubercles, = P. atrior, *C. B. Ad.)* Operculum broader than in D. luctuosa, of a deep rich purplish red colour, very glossy inside. The spire outlines are very convex in the adult, which has somewhat the aspect of a small D. rudis. The smallest adult sp. (decollated) measures ·34 by ·15. The longest, *long.* ·72, *long. spir.* ·36, *lat.* ·24, *div.* 35°. (anfr. sup.) The broadest sp. measures *lat.* ·28, *div.* 40°.

Hab. — Monte Christi; under stones, *Cuming.* — Panama; 14 sp. do. at low water mark; *C. B. Adams.*—Mazatlan; not common, often incrusted with coralline, very rarely with mud; *L'pool Col.*

Tablet 1891 contains 8 specimens, different ages.—1892, 4 sp. spire more elevated.—1893, 3 sp. acuminated; sculpture sometimes nearly obsolete.—1894, 3 sp. dwarf state.—1895, 2 sp. light band developed.—1896, 2 sp. with opercula, one normal, the other with nucleus subcentral; and one separate operculum.

462. ?DRILLIA CERITHOIDEA, *n. s.*

?D. t. "D. aterrimæ" simili; sed carinæ infrasuturali carente, (interdum striæ majore hic monstrante,) areâ sinus angustiore, haud excavatâ, superiore; monilibus spiralibus in basi pluribus; tuberculis in spirâ magis conspicuis; labro serrato, sinu pro-

fundo, ad aperturam contracto, spiram subascendente, callo parietali minore; zonæ translucidæ carente.

Two perfect specimens and one broken were found of this species, which resembles D. aspera, *Hinds*, and D. thiarella, *Val.* but does not accord in sculpture with either. It is known at once from D. aterrima by the position of the slit, which is much nearer the suture and slopes upwards. This causes more of the tubercles to be seen on the spire. *Long.* ·64, *long. spir.* ·4, *lat.* ·26, *div.* 35°.

Hab.—Mazatlan; 3 sp. only; *L'pool Col.*

Tablet 1897 contains the perfect specimen. In the young shell, the slit is quite close to the suture.

463. DRILLIA ZONULATA, *Rve.*

Pleurotoma cincta, *Sow. Proc. Zool. Soc*, 1833, p. 136. (Non *Lam. An. s. Vert.* vol ix. p. 347, no. 8:—*Kien. Icon. Conch.* p. 60, no. 38, pl. 19, f. 3. Mauritius.)
Pleurotoma zonulata, *Rve. Conch. Syst.* 1848, pl. 234, f. 10:—*Conch. Ic.* pl. 6, f. 39.—*C. B. Ad. Pan. Shells*, p. 148, no. 184.
Crassispira (Drillia) zonulata, *H. & A. Ad. Gen.* i. 91.

This pretty little species is known from D. aterrima, not only by the yellow neck-lace on the spire and the yellow belt on the base, but by the comparative smoothness of the infrasutural groove, and the shape of the tubercles, which are very narrow, but greatly elongated spirally. *Long.* ·65, *long. spir.* ·39, *lat.* ·25, *div.* 35°.

Hab.—Monte Christi and Xipixapi; in sand and gravel 7 fm.; *Cuming.*—Panama; 2 sp. *C. B. Adams.*—Mazatlan; 1 sp.; *L'pool Col.*

Tablet 1898 contains the specimen.

464. DRILLIA MONILIFERA, *n. s.*

D. t. turritâ, nigrâ, aurantio gemmatâ; anfr. subplanatis, omnino minutissime et confertissime spiraliter striulatis; regione infra-suturali haud excavatâ; striâ juxta suturam vix tuberculatâ; circa peripheriam zonâ aurantiacâ, tuberculis parvis, circiter xii. *ornatâ; et infra, striis spiralibus, circiter* v., *tuberculis minimis convenientibus; tuberculis omnibus et striis plerumque aurantiacis; aperturâ intus, nisi ad zonam subdiaphanam, purpureo-nigrâ.*

Only one specimen, not quite mature, was found of this species, which resembles D. aterrima, zonulata, &c. but is easily recognized by the non-excavation and extremely faint keeling of the area of the sinus; and the colour, which presents one large and several minute rows of connected orange tubercles upon a black ground. *Long.* ·64, *long. spir.* ·41, *lat.* ·23, *div.* (anfr. prim.) 30°.

Hab.—Mazatlan; 1 fresh adolescent sp.; *L'pool Col.*

Tablet 1899 contains the specimen.

465. DRILLIA ALBOVALLOSA, *n. s.*

D. t. adolescente subturritâ, nigrâ; costâ rotundatâ, albidâ, expressâ, spiram ascendente; marginibus spiræ subincurvatis; totâ superficie confertim spiraliter striulatâ, striulis in aream sinus haud excavatam magis expressis; costâ albâ suturam approximante, haud attingente, undato-tuberculatâ; serie tuberculorum, circiter XVII., *angustorum, radiatim elongatorum, vix in spirâ monstrante; striis spiralibus circa basim, quarum superiores tuberculosæ, tuberculis alteris convenientibus: t. adultâ anfr.* III.–IV. *omnino costæ albæ carente; vice ejus serie tuberculorum infrasuturalium, tuberculis peripherialibus anfractus alterius convenientium; anfr. ult. parum descendente; marginibus spiræ excurvatis; aperturâ subovali; sinu postico lato, haud profundo; nigro-fuscâ, prope sinum posticum maculis subdiaphanis ornatâ.*

Only one specimen of this shell was found in the Mazatlan collection. The spire is rather compact, last whirl somewhat projecting, white band not quite touching the suture, and peripheral tubercles shewing more in the early than in the latter whirls. A specimen of unknown locality in Dr. Gould's collection appears to be conspecific, but is larger, spire rather more elevated, markings not so decided (perhaps rubbed) and with the band smooth and yellowish. A shell however appears in the Cumingian Museum, of uncertain history, which begins exactly like the Mazatlan specimen, with the white ridge round about six whirls; after which it suddenly changes, developing three whirls and a half without any white ridge, and presenting the general appearance of D. rudis. Even this specimen is not quite mature, as is shewn by the sharp unformed labrum. The faint, semi-transparent spots above the tubercles round the periphery are only seen by holding the

shell up to the light. The Mazatlan specimen, young state, measures *long.* ·42, *long. spir.* ·22, *lat.* ·19, *div.* 30°—40°.
Mr. Cuming's sp. „ 1·08, „ ·64, „ ·39, „ 30°.

Hab.—Mazatlan; 1 fresh adolescent sp.; *L'pool Col.*

Tablet 1900 contains the specimen.

466. DRILLIA ALBONODOSA, *n. s.*

D. t. turritâ, nigrâ, gracili; epidermide tenui, lævi, fuscâ, indutâ; anfr. iii. *nucleosis,* vii. *normalibus, parum excurvatis; tuberculis valde extantibus, circiter* viii. *acutioribus, serie peripheriali ornatâ; aliter sublævi, striis distantibus et striulis confertis minimis spiralibus vix ornatâ; areâ infrasuturali haud excavatâ; aperturâ subovali; labro acuto, vix serrato; sinu postico profundo, parvo, rotundato, constricto; supra, intus suturam, callosâ; labio parvo, lævi.*

This species resembles Clavatula cælata and Cl. micans, *Hinds*, and also a species from Honduras. The sculpture is extremely faint, except the strong row of tubercles. *Long.* ·51, *long. spir.* ·28, *lat.* ·17, *div.* 30°.

Hab.—Mazatlan; 2 sp. and fragments: *L'pool Col.*

Tablet 1901 contains a perfect specimen.

467. DRILLIA LUCTUOSA, *Hinds.*

Clavatula luctuosa, *Hinds, Proc. Zool. Soc* 1843, p. 40:—*Voy. Sulph. Moll.* p. 18, no. 58, pl. 6, f. 4.
Pleurotoma luctuosa, *Rve. Conch. Ic.* pl. 18, sp. 149.
Crassispira (Drillia) luctuosa, *H. & A. Ad. Gen.* i. 91.
Non Pl. luctuosa, *D'Orb. B. M. Cat. Cub. Moll.* p. 31, no. 370.

This unpretending little species is easily recognized by its black colour and faint sculpture. A row of small tubercles ascends the spire, scarcely discernible on the last whirl, which (as in D. rudis) descends and rises again at the mouth, making the spire-outlines curvilinear. The first three whirls are smooth. Surface with extremely fine lines of growth, faintly decussated by spiral striulæ. Labrum sharp, not serrated, with a swelling behind; anterior sinus very distinct, as in Strombus; posterior notch deep; sutural callosity large, joining the well-developed labium. Operculum shaped as in D. maculosa, with more or less of a reddish tinge. Spire generally incrusted

with blackish mud, sometimes bearing round flat egg-cases, pierced in the middle. *Long.* ·61, *long. spir.* ·32, *lat.* ·25, *div. (anfr. sup.)* 40°.

Hab.—Bay of Guayaquil; Gulf of Magdalena, California, 5—22 fm.; *Hinds.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 1902 contains 5 sp. immature.—1903, 6 sp. adult.—1904, 2 sp. mended after fracture.—1905, 1 sp. with egg-cases.—1906, 1 sp. with operculum; also 2 separate opercula, one normal, the other with sub-central nucleus.

468, ?Drillia Hanleyi, *n. s.*.

*?D. t. subacuminatâ, nigrâ, epidermide tenui nigro-cinereâ, indutâ; anfr. ?*xi. *subplanatis; canali infrasuturali angusto et totâ superficie tenuissime spiraliter striatis; carinâ parum prominente juxta suturam; costulis radiantibus concinnis, valde acutis, circiter* xv. *vix declivibus; aperturâ nigrâ; t. adolescente sinu parvo; t. adultâ ?.....*

Somewhat resembles the young of D. luctuosa, but is known by the fine costæ, continued nearly to the base and the infrasutural keel. It has some points in common with Defrancia cælata, *Hinds*, but its analogies seem to be with D. aterrima, &c. The only specimen found (which has its upper whirls smooth) is not quite mature, and measures *long.* ·38, *long. spir.* ·24, *lat.* ·15, *div.* 32°.

Hab.—Mazatlan; 1 fresh sp., *L'pool Col.*

Tablet 1907 contains the specimen.

469. Drillia ———, *sp. ind.*

Tablet 1908 contains a shell, too much rubbed for description, and a spiral fragment which may be conspecific; reddish brown, with a white spiral band. It closely resembles a W. Indian species. Shell with 6 normal whirls, and a rounded vertex of 3 smooth whirls. *Long.* ·35, *lat.* ·14.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

470. Drillia ———, *sp. ind.*

Tablet 1909 contains a specimen, too much worn for description, of a small turrited species of about 7 whirls, measuring

·17 by ·07. It has a very broad, excavated infrasutural area, with a faint keel above, and one row of small tubercles below, shewing on the spire, and other smaller tubercular spiral lines beneath.

Hab.—Mazatlan; 2 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1910 contains an imperfect operculum, which may belong to a large Drillia; of a rich, dark brown colour, rather undulated, with very faint marks of growth; inside with a large, nearly smooth scar bounded by a ridge.

Tablet 1911 contains a very small operculum of somewhat concentric elements; very thin; not unlike that of Clavatula bimarginata, figured in *H. & A. Ad. Gen.* vol. i. pl. 10, f. 5*a*.

Genus CLATHURELLA.*

Defrancia, *Millet, Ann. Soc. Linn. Par.* 1826.—*Gray, Fig. Moll. An.* p. 73.—*Phil. Handb. Conch.* p. 137.—*H. & A. Ad. Gen.* vol. i. p. 95.—(Non Defrancia, *Müll. Ind. Moll. Groenl.* p. 12, = Bela, *Leach*:—nec Defrancia, *Bronn.* 1825.)

Clavatula, pars, *Hinds.*—The Lamarckian genus is restricted by Gray to the species which have a Purpuroid operculum. These shells are said to have none.

471. Clathurella rava, *Hinds.*

Clavatula rava, *Hinds, Proc. Zool. Soc.* 1843, p. 39:—*Voy. Sulph. Moll.* p. 17, no. 53, pl. 5, f. 18.

Defrancia rana, *H. & A. Ad. Gen.* i. 96.

?Non Pleurotoma rava, *Rve. Conch. Ic.* pl. 28, sp. 250. (Isl. Mindanao, Philippines, *Cuming.)*

Two beautiful specimens were found, exactly agreeing with the accurate figure and description in the *Voy. Sulph. Moll.* As Reeve's shell is from the Philippines, and differs in some particulars from this, it is probably a distinct species. Shell orange, with two purple brown bands; one in the infrasutural channel, which is ornamented with very fine undulated spiral striulæ; the other continuing the suture round the base, and staining the inside of the aperture. Labrum and labium armed

* This name is proposed for a convenient group of the Mangelia tribe; the name Defrancia, previously in use, being preoccupied, *v.* supra, p. 6.

with denticles inside; notch deep but narrow. Whirls rounded, with 11—13 radiating costæ, decussated by spiral striæ, of which about 5 shew on the upper whirls. *Long.* ·38, *long. spir.* ·23, *lat.* ·17, *div.* 32°.

Hab.—Gulf of Nicoya; 18 fm. mud; *Hinds.*—Mazatlan; 2 sp. only; *L'pool Col.*

Tablet 1912 contains the largest specimen.

472. CLATHURELLA AUREA, *n. s.*

Cl. t. valde attenuatâ, aureâ, epidermide tenui, interdum aurantiâ, tinctâ; anfr. ix. *convexis, canali infrasuturali latiore, lineis incrementi arcuatis distinctis ornato; tuberculis costæformibus* viii.—x. *rotundatis in peripheriam, secundum lineas spirales,* iii. *in spirâ, tuberculatis; anfr. ult. costulis radiantibus infra tuberculos confertis, lirulis confertis spiralibus tuberculatis; aperturâ et canali subelongatis; labro varicoso, crasso, intus dentato; sinu postico profundo, angusto, spiram subascendente, supra calloso; labio tenui, dentato.*

Approaches Cl. bicanalifera, *Sow.* but differs in the narrow slit, and singularly decussated groove. The varix is extremely thick. The costular tubercles which appear on the spire, do not correspond with the narrow crowded ribs which appear on the basal portion. It is more slender than Cl. rava, with different colour and sculpture. *Long.* ·54, *long. spir.* ·26, *lat.* ·18, *div.* 25°.

Hab.—Mazatlan; 1 fresh specimen; *L'pool Col.*

Tablet 1913 contains the specimen.

GENUS MANGELIA, *Risso.*

Hist. Nat. Eur. Mer. vol. iv. p. 219, 1826:—do. *Leach,* ms.—*H. & A. Ad. Gen.* vol. i. p. 99. (Non Mangelia, *Rve. Conch. Ic.*=Cithara, *Schum.*)

Mangilia (err. cor.) *Phil. Handb. Conch.* p. 38.

473. MANGELIA PACUTICOSTATA, *var.* SUBANGULATA.

M. t. rubro-fuscâ, subturritâ; apice haud acutâ, anfr. iii. *lævibus; anfr. normalibus* iv. +....., *excurvatis; costis* x. *acutioribus, subundulatis, ad basin continuis, lineis plerumque spiram oblique ascendentibus, ad peripheriam subangulatis;*

interstitiis latis, spiraliter vix striulatis, basi vix striatâ ; aperturâ subpyriformâ ; labro acuto, secundum costas vix sinuato : labio inconspicuo.

Mangelia acuticostata, *Proc. Zool. Soc.* June, 1856.

Resembles M. neglecta, *C. B. Ad.* which however is described as having an elevated spiral line on the middle of the whirls, and basal striæ. *Long.* ·138, *long. spir.* ·074, *lat.* ·07, *div.* 35°.

Hab.—Mazatlan ; 1 sp. off Spondylus ; *L'pool Col.*

Tablet 1914 contains the specimen.

Genus CITHARA, *Schum.*

Ess. no. 106, 1817.—*Woodw. Man.* p. 115.
Cythara, *H. & A. Ad. Gen.* vol. i. p. 98.
Mangelia, *Rve. Conch. Ic.* (non *Risso)* maxima pars.

474. ?Cithara ———, *sp. ind.*

Tablet 1915 contains a broken shell with 7 long, straight, sharp ribs and very crowded spiral striæ ; mouth sublinear ; labrum thickened, except at the notch. There is no trace of teeth within.

Hab.—Mazatlan ; 1 sp. off Spondylus ; *L'pool Col.*

Family CONIDÆ.

Genus CONUS, *Linn.*

The Mazatlan Cones do not appear to be rich either in species or individuals ; nevertheless, if not valuable to collectors, they were interesting through possession of the epidermis, and often of the opercula. These are very small for the shell, elongated, and narrow ; with the apex terminal, usually decollated, and often much broken. When repaired, as in other families, it sometimes assumes the concentric type.

475. Conus regularis, *Sow.*

Conch. Ill. pl. 29, f. 29, pl. 36, f. 45.—*Rve. Conch. Ic.* pl. 26, sp. 126.—*Lam. An. s. Vert.* vol. xi. p. 132, no. 189.—*Kien. Icon. Conch.* p. 124, no. 103, pl. 23, f. 3, var.—*Mke.* in *Zeit.*

f. Mal. 1851, p. 22, no. 97.—*C. B. Ad. Pan. Shells*, p. 110, no. 120.

Leptoconus regularis, *H. & A. Ad. Gen.* i. 252.

Comp. Conus arcuatus, *Brod. & Sow. Zool. Journ.* vol. iv. p. 379.—*Zool. Beech. Voy.* p. 119, pl. 36, f. 22.—*Rve. Conch. Ic.* pl. 15, f. 77, 77*b*. (Mazatlan.)

This was the least uncommon of the Mazatlan Cones, but few of the specimens were in a state attractive to collectors. The spire outlines are generally incurved. It is known at once by the conical form, and dark tessellations over a lighter chestnut ground. Epidermis extremely thin, adherent, almost smooth; on the sinus area, with coarse ridges of growth, surmounted by fine bristles in spiral rows. The animal probably retires some way into the shell, as the epidermis is not removed on the labium within the aperture. Operculum outside more or less concave; with the muscular scar shewing non-angular ridges of growth. The largest of the specimens measures *long.* 2·38, *long. spir.* ·4, *lat.* 1·28, *div.* 120°.
An elevated sp. „ 2·38, „ ·57, „ 1·12, „ 84°.

Hab.—Gulf Nicoya and Panama; in soft mud 7—23 fm.; *Hinds.*—Taboga; 1 imperfect sp. *C. B. Adams.*—Guaymas, *Lieut. Green.*—Mazatlan; not common; *L'pool Col.*

Tablet 1916 contains 3 sp. broad form.—1917, 3 sp. elongated.—1918, 1 do. spire outlines nearly straight.—1919, 1 sp. spire very much elevated.—1920, 2 sp. after hot acid, shewing colour.—1921, 4 sp. curiously deformed after fracture; one with a spiral canal.—1922, 1 normal and 2 abnormal opercula.

476. CONUS PURPURASCENS, *Brod.*

Proc. Zool. Soc. 1833, p. 54.—*Müll. Syn. Nov. Test. Viv.* p. 21.—*Sow. Conch. Ill.* pl. 25, f. 13.—*Rve. Conch. Ic.* pl. 19, f. 105.—*Desh.* in *Lam. An. s. Vert.* vol. xi. p. 134, no. 193.—*Kien. Icon. Conch.* p. 189, pl. 39, f. 2, pl. 61, f. 3.—*C. B. Ad. Pan. Shells*, p. 108, no. 118.

Chelyconus (Leptoconus) purpurascens, *H. & A. Ad. Gen.* i. 254.

+ Conus comptus, *Gould, Cal. & Mex. Shells*, p. 14, pl. 14, f. 123.

? + Conus interruptus, *Brod. & Sow. Zool. Journ.* vol. iv. p. 379:—*Zool. Beech. Voy.* p. 119, pl. 33, f. 2.—*Rve. Conch. Ic.* pl. 22, f. 125.

This shell may be the C. achatinus of Menke, instead of the next ?species. It is closely allied to that and several other forms. The epidermis, when very fresh, is thin, dark olive, with more or less conspicuous scaly ridges of growth, crossed by spiral lines of short bristles, of which one is conspicuous on the shoulder; in the sinus area, imbricated. A swollen sp. measures *long.* 2·18, *long. spir.* ·33, *lat.* 1·37, *div.* 110°. An elongated sp. „ 2·07, „ ·3, „ 1·07, „ 110°.

Hab.—Is. Annaa, Sowerby. [?]—Panama; in sandy mud in clefts of rocks; *Cuming.*—Do.; 12 sp. under stones, at extreme low water mark; *C. B. Adams.*—San Blas, *Hinds.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1923 contains 3 sp. somewhat varying.—1924, 3 sp. approaching C. regalitatis.

477. CONUS REGALITATIS, *Sow.*

Proc. Zool. Soc. 1834, p. 19.—*Müll. Syn. Nov. Test. Viv.* p. 124.—*Sow. Conch. Ill.* pl. 57, f. 87.—*Rve. Conch. Ill.* pl. 40, f. 218.—*Lam. An. s. Vert.* vol. xi. p. 133, no. 192.—*Kien. Icon. Conch.* p. 237, pl. 39, f. 3.—*C. B. Ad. Pan. Shells*, p. 109, no. 119.

?=C. achatinus, *Mke.* in *Zeit. f. Mal.* 1847, p. 183, no. 23.* (non *Brug.*)

Chelyconus (Leptoconus) regalitatis, *H. & A. Ad. Gen.* i. 254.

?An C. purpurascens, *var.*

The few specimens belonging to this form were soon caught up by collectors. It is distinguished by the shape and painting; but the Mazatlan specimens were not so constant in these respects as to have authorized the separation. At the same time they were not numerous enough to warrant me in uniting what those who have paid particular attention to the tribe have had grounds for separating. Epidermis generally smoother than in C. purpurascens. *Long.* 2·1, *long. spir.* ·37, *lat.* 1·1, *div.* 11°.

Hab.—Real Llejos; in clefts of rocks on sandy mud; *Cuming.*—Panama; 9 sp. under stones at extreme low water, (one measuring 3·); *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1925 contains the finest specimen.

* Dr. Menke also quotes in his list the well known C. omaria, *Zeit. f. Mal.* 1851, p. 23, no. 99, as from Mazatlan, though he informs his readers that it is generally thought to be E. Indian.

[478. CONUS ARENATUS, *Brug.*

Dict. no. 16.—*Dillw. Descr. Cat.* vol. i. p. 400, no. 83.—*Rve. Conch. Ic.* pl. 17, f. 92.—*Lam. An. s. Vert.* vol. xi. p. 22, no. 18.

For other references, v. *Desh.* in loc.

One extremely worn specimen of this well-known E. Indian shell, was found in the Cone box. It probably came in ballast. It measures 1·98 by 1·1.

Hab.—Ceylon and Philippines, *auct.*—Mazatlan; 1 dead sp.; *L'pool Col.*

Tablet 1926 contains the specimen.]

479. CONUS PUNCTICULATUS, *Hwass.*

Encycl. Meth. Vers. i. pt. 2, p. 704.—*Rve. Conch. Ic.* pl. 20, sp. 116.—*Kust. Mart.* p. 41, no. 28, pl. 6. f. 8.—*Kien. Icon. Conch.* p. 172, no. 146, pl. 60, f. 1.—*Lam. An. s. Vert.* vol. xi. p. 85, no. 114, var. *b.*—*Mke.* in *Zeit. f. Mal.* 1851, p. 23, no. 98.

Chelyconus (Leptoconus) puncticulatus, *H. & A. Ad. Gen.* i. 254.

Lam. gives this name as of *Brug.* and quotes it from China. There is a closely allied E. Indian species, differing principally in having white between the dots on the spiral lines. The Mazatlan shell is more or less swollen, with nodulous spiral lines near the base: inside lavender. The epidermis is thin, nearly smooth, adherent.—The operculum outside is concave, with regular lines of growth; the muscular scar displays a few strong, angular ridges of growth. The largest specimen measures *long.* 1·3, *long. spir.* ·25, *lat.* ·82, *div.* 110°.
A broad sp. „ 1·2, „ ·23, „ ·78, „ 110°.
An elongated sp. „ 1·28, „ ·3, „ ·72, „ 90°.

Hab.—Salango and St. Elena; sandy mud, 5—9 fm.; *Cuming.*—Mazatlan; rare; *L'pool Col.*

Tablet 1927 contains 3 sp. normal state.—1928, 3 sp. with red-brown patches small.—1929, 1 sp. patches diffused, resembling the young of C. purpurascens.—1930, 3 sp. slender form.—1931, 3 sp. stout form.—1932, 2 sp. after hot acid, shewing colour.—1933, 4 sp. mended after severe fracture; in one the canal is twisted to the right, occupying the place of the anterior sinus in Strombus.—1934, 1 operculum.

480. CONUS GLADIATOR, *Brod.*

Proc. Zool. Soc. 1833, p. 55.—*Müll. Syn. Nov. Test. Viv.* p. 121.—*Sow. Conch. Ill.* pl. 33, f. 34.—*Rve. Conch. Ic.* pl. 22, f. 127.—*Kien. Icon. Conch.* p. 25, pl. 15, f. 4, pl. 109, f. 4.—*C. B. Ad. Pan. Shells*, p. 105, no. 114.
Rhizoconus (Leptoconus) gladiator, *H. & A. Ad. Gen.* i. 252.

This unpretending species is known when fresh by its extremely thick, somewhat deciduous epidermis, which lies in a spongy mass, with ridges of growth, and distant spiral rows of hairs, which often group into pairs. It is thick on the spire, with a row of scaly bristles over the tuberculous shoulder. Sinus area spirally striated. The elevation of the spire is extremely variable. Operculum resembling that of C. puncticulatus, but larger, less bent, and commonly decollated. The largest sp. measures *long.* 1·77, *long. spir.* ·17, *lat.* 1·12, *div.* 140°.
A flat sp. „ 1·26, „ 0, „ ·83, „ 183°.
A slender sp. „ 1·64, „ ·2, „ ·9, „ 130°.
Hab.=Panama; in sandy or soft mud, in the clefts of rocks; *Cuming.*—Do.; at low water mark, mostly under stones which were more or less mingled with sand, not uncommon; *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; rare, generally encrusted with coralline, Bryozoa, &c.; *L'pool Col.*

Tablet 1935 contains 3 sp. stout, elevated.—1936, 3 do. normal.—1937, 3 do. flat.—1938, 3 sp. slender, flattened.—1939, 3 do. elevated.—1940, 3 sp. mended after fracture.—1941, 1 sp. with rough portion of epidermis removed, resembling C. regalitatis.—1942, 2 sp. epidermis removed.—1943, 4 opercula, of which one is normal, and another is mended from a sub-central nucleus.

481. CONUS NUX, *Brod.*

Proc. Zool. Soc. 1833, p. 54.—*Müll. Syn. Nov. Test. Viv.*—p. 120.—*Sow. Conch. Ill.* pl. 32, f. 31.—*Rve. Conch. Ic.* pl. 20, f. 110.—*Desh.* in *Lam. An. s. Vert.* vol. xi. p. 129, no. 185.—*Kien. Icon. Conch.* p. 47, pl. 11, f. 3, pl. 102, f. 2.—*C. B. Ad. Pan. Shells*, p, 106, no. 116.
Coronaxis (Conus) nux, *H. & A. Ad. Gen.* i. 248.

Most of the Mazatlan specimens are distorted, but may be recognized by the deep violet stain at the base, and the nearly smooth epidermis, which is adherent, with faint striæ of growth. The spire is tuberculous, sometimes flattened. The

operculum is externally deeply concave; inside simple. The largest specimen is only 1·1 long. One with elevated spire measures *long.* 1·02, *long. spir.* ·14, *lat.* ·63, *div.* 128°.
A flattened sp. „ 1·04, „ ·06, „ ·78, „ 170°.

Hab.—Galapagos, *Cuming.*—Taboga, 2 sp. *C. B. Adams.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 1944 contains 2 sp. normal, and an operculum.—1945, 2 sp. distorted.

482. Conus ? scalaris, *Val.*

Rec. Obs. Humb. & Bonpl. vol. ii. p. 338.—*Kien. Icon. Conch.* p. 158, no. 133, pl. 88, f. 5.

Tablet 1946 contains a rubbed small specimen, ·54 in length, which perhaps belongs to this species.

Hab.—Acapulco, Valenciennes.—?Mazatlan; 1 dead sp. *L'pool Col.*

483. ?? Conus ————, *sp. ind.*

Tablet 1947 contains the spiral part of a thin shell with 4 smooth rounded nuclear whirls, rather projecting, and 4 flattened projecting normal whirls, spotted with purple brown; smooth, with raised, somewhat nodose bands on each side of the suture. It may possibly belong to Pyrella, *Swains.* [=Tudicla *(Bolt.), H & A. Ad.* vol. i. p. 151.].

Tablet 1948 contains the distorted operculum of a Conus, of concentric elements, with one end elongated.

Suborder PROBOSCIDIFERA.

Family SOLARIADÆ.

The shells of this family have the nuclear whirls slanting and sunken, as pointed out by Woodward. The shape agrees in Solarium, Torinia and Bifrontia. In Philippia, *Gray*, the nucleus has the same character, but is larger in proportion, more globular, with one conspicuous whirl. A similar difference obtains between Chemnitzia and Odostomia in Pyramidel-

lidæ, to which family these very different-looking shells seem allied. The animal of Philippia is said however to be a Scutibranch Trochid.

Genus TORINIA, *Gray*.

H. & A. Ad. Gen. vol. i. p. 242. Shell rounded: operculum trochiform, as in Bifrontia.

484. Torinia ?variegata, *Lam.*

Solarium variegatum, *Lam. An. s. Vert.* vol. ix. p. 99, no. 6.
Trochus perspectiviunculus variegatus, *Chem. Conch. Cab.* vol. v. pl. 173, f. 1708-9.
=Euomphalus radiatus, *Mke.* in *Zeit. f. Mal.* 1850, p. 170, no. 27.
Comp. Solarium, sp. ind. *c.*, *C. B. Ad. Pan. Shells*, p. 190, no. 272.

Menke states that his shell is that of Chemnitz, but is not the Solarium variegatum of Lamarck as Kiener and Deshayes suppose. If the Lamarckian species, which is said to be from N. Zealand, be distinct, the name of *Mke.* is certainly shorter than that of *Chemn.* which is adopted however by *Dillw. Rec. Sh.* p. 783, no. 59. On a very close comparison with one of the Barbadoes species, (supposed to be the Lamarckian shell,) I am unable to detect any specific difference. Mr. Cuming has the same form from Isle Annaa.

The Mazatlan shell differs from Torinia areola, *Chemn.* (=Solarium tessellatum, *Desh.* olim; v. *Lam. An. s. Vert.* vol. ix. p. 100, no. 8) in having a rounder base, and in not having the first row of granules below the suture white. Of this species, the locality of which was not known by *Desh*, I have a specimen answering exactly to the description from the W. Indies. The name is given in the Br. Mus. to a specimen sent from California by Lady K. Douglas. The Gulf species has a very rounded outline, with numerous spiral ribs of which generally four appear on the spire. They are rendered granulose by strong striæ of growth. The umbilicus has two strong granulose spiral keels, which crenulate the subquadrate mouth. The operculum, which was preserved in four of the specimens, is very conical, and has about 10 turns bounded by raised ridges. Colour purplish brown tessellated with light. Epider-

mis rather thin, conspicuous, adherent, of a horny olivaceous colour. *Long.* ·52, *long. spir.* ·32, *lat.* ·63, *div.* 90°.

Hab.—Mazatlan; 5 sp. very perfect; *L'pool Col.* (For other localities, v. supra.)

Tablet 1949 contains the most characteristic specimen.

485. Torinia ? granosa, *Val.*

Solarium granosum, *Val. Rec. Obs.* vol. ii. p. 269. Described as the living analogue of the Italian fossil, S. milligranum. Comp. Solarium fenestratum, *Hinds.*

Tablet 1950 contains a fragment of the base of a very distinct species. It is flat, with numerous strongly granular spiral rows, and deeply cut broad interstices.

Hab.—Acapulco, *Humboldt & Bonpland.*—? Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Family PYRAMIDELLIDÆ.

This family, the smaller forms of which are so abundant in our own seas that Clark speaks of it as a "truly British group," which far outnumbers the discoveries of any other country," is probably well represented in most places, but has escaped attention in consequence of the minuteness of most of its members. While the assiduous and almost exhaustive labours of British malacologists have eliminated 44 species, of which Clark regards 20 as spurious, the mere refuse from a few Mazatlan shells has displayed forms which have required the enumeration of 72 species to contain them. All the sectional forms described from our own seas are here represented, with the addition of some not hitherto distinguished. While rich in species however, the materials at our command were very sparing in specimens, only one (Chrysallida communis, *C. B. Ad.*), which appears to be littoral in its habits, being at all common. Next to this ranks Chr. ovulum, then Eulima ? distorta. What must be the richness of the ocean bed itself, if so many have left traces of their existence on the backs of a few oysters!

The generic distinctions in this family, as in Helicidæ and Veneridæ, are confessedly of little value. Links are found which unite all that have been yet proposed. When however

species are so numerous and so difficult to identify, the grouping of similar forms and the separation of large assemblages is a great convenience to the student. Clark, whose researches among the animals of this tribe are most minute and valuable, regards the presence or absence of a columellar plait as a variable character even in the same species: v. *Moll. Test. Mar. Brit.* pp. 395—454. The Mazatlan species appear constant in this character; although the plait, when present, is often hidden, and cannot be seen except in broken shells, which thus assume a more than usual value. One of the best characters is found to be the shape and size of the sinistral portion: the first observations of it however must be taken with caution, as slight changes in the light or angle of observation cause very different appearances under the microscope.

Genus OBELISCUS, *Humph.*

Gray, Proc. Zool. Soc. 1847, p. 159.—*H. & A. Ad. Gen.* vol. i. p. 229.

Pyramidella, pars, *auct.*—This group is intermediate between the typical Pyramidellæ and Odostomia, differing from the former in its smooth surface and scarcely channeled mouth; from the latter, in its numerous whirls and in the columellar plaits. Several species, very turrited but with a single lamelliform plait, which are found recent in different seas, and also fossil, may be ranked with either genus.

486. Obeliscus ?conicus, *jun. C. B. Ad.*

Pyramidella conica, *C. B. Ad. Pan. Shells*, no. 294, pp. 200, 318.
Obeliscus conicus, *H. & A. Ad. Gen.* i. 230.

A solitary young shell, with 5 normal whirls, agrees generally with the Panama species, especially in having the suture in a groove which travels round the periphery, and in having two very small plaits under one which is large and lamelliform. It differs in the base which is scarcely angulated, and in the divergence which is greater. Both these features may alter in the adult shell. The apex might appear "very acute" in an adult of 14 whirls, though it is rather obtuse in this specimen; the nuclear whirls (one and a half) which are like a tumid Planorbis, being sunken in the normal portion, of which it covers about two-thirds. *Long.* ·105, *long. spir.* ·065, *lat.* ·055, *div.* 28°.

Hab.—Panama, 1 sp. *C. B. Adams.*—?Mazatlan; 1 young sp., off Chama; *L'pool Col.*

Tablet 1951 contains the specimen.

Genus ODOSTOMIA, *Flem.*

Edinb. Encycl. 1817, p. 130.
Jaminea, *Brown, Couth.* &c..
Odontostomia, *Phil.* in *Zeit. f. Mal.* 1849, p. 28.
Odontostoma, *Phil. Handb. Conch.* p. 192: non *D'Orb.*; nec Odontostomus, *Beck.*

For convenience' sake, the genus is here restricted to the smooth species; the sculptured forms being located under Parthenia; and the pupiform species under Chrysallida. All the divisions in this family must be regarded as provisional, till we know more of the forms from different seas. Some of the following species differ from the typical forms in having the peritreme continuous.

Section A. *Peritreme not continuous.*

487. Odostomia sublirulata, *n. s.*

O. t. ovoideâ, suboblongâ, subdiaphanâ, albâ; anfr. nucleosis declivibus, in truncatione latiore celatis; anfr. iv. *normalibus, subrotundatis, suturis distinctis, basi elongatâ, haud umbilicatâ; in spirâ, lævi; infra peripheriam lirulatâ, lirulis subobsoletis, rotundatis, interstitiis parvis; aperturâ ovatâ, labro acuto; peritremati circa basin usque ad parietem continuo; labio in pariete nullo; plicâ transversâ, obtusiore, conspicuâ.*

One beautifully perfect specimen was found of this elegantly formed species, agreeing with the typical forms in not having any parietal lip. *Long.* ·078, *long. spir.* ·038, *lat.* ·042, *div.* 28°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1952 contains the specimen.

488. Odostomia ———, *sp. ind.*

Tablet 1953 contains a portion of a specimen larger than O. sublirulata, with the whirls planate, and with very fine distant indented striæ over the whole surface.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

489. ODOSTOMIA LAMELLATA, *n. s.*

O. t. conicâ, turritâ, solidâ, albâ; vertice nucleoso satis magno, declivi, maximam partem truncationis tegente; anfr. normalibus subplanatis, lævibus, ad peripheriam angulatis, haud carinatis; suturâ parum impressâ; plicâ magnâ, extante, lamellosâ, declivi.

The description is compiled from portions, the only perfect specimen found having been broken under the microscope. This species, if it had secondary plaits, would rank with Obeliscus. It closely resembles O. canaliculata, *C. B. Ad. Contr. Conch.* no. 7, p. 109) from Jamaica; but differs in being a wider shell, with the base more angulated. It probably had five normal whirls, and measured *long.* ·1+, *lat.* ·04, *div.* 23°.

Hab.—Mazatlan; portions of 4 sp. off Chama; *L'pool Col.*

Tablet 1954 contains the young and old portions from which the complete idea may be constructed.

490. ODOSTOMIA SUBSULCATA, *n. s.*

O. t. "O. lamellatæ" simili; sed anfr. planatis, peripheriâ vix carinatâ, plicâ obtusâ, solidâ, transversâ; vertice nucleoso ut in "O. vallatâ."

Differs from O. mammillata and O. vallata in the solid texture of the shell, and strength of the plait. A young shell, with three normal whirls, measures *long.* ·044, *long. spir.* ·024, *lat.* ·028, *div.* 30°.

Hab.—Mazatlan; 4 imperfect sp. off Chama; *L'pool Col.*

Tablet 1955 contains 2 specimens.

SECTION B. *Peritreme continuous.*

491. ODOSTOMIA VALLATA, *n. s.*

O. t. conicâ, parvâ, subdiaphanâ, tenui, albâ; vertice nucleoso parvo, parum declivi, dimidium truncationis tegente; anfr. normalibus iii. et dimidio, planatis, suturâ effossâ; carinulâ, super fossam, et spiram et peripheriam decurrente; peripheriâ acute angulatâ, basi planatâ, umbilico conspicuo; aperturâ continuâ; plicâ obtusâ, transversâ, celatâ, juxta parietem sitâ.

This beautiful little species, of a semi-transparent chalcedonic texture, is remarkable for its exactly conical form, well

marked umbilicus, continuous and very thin peritreme, and for the *vallum*, consisting of a little ditch and mound at the suture, which are carried round the base. *Long.* ·055, *long. spir.* ·032, *lat.* ·028, *div.* 30°.

Hab.—Mazatlan; 10 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1956 contains 3 sp., one young, translucent, another adult, the third slightly distorted in growth.

492. ODOSTOMIA MAMMILLATA, *n. s.*

O. t. "*O. vallatæ*" *simili, sed angustiore; vertice nucleoso subtumente, anfr. primo normali rotundato; carinulâ nullâ; ?plicâ celatâ.*

The plait does not appear in the only specimen found. It is probable however, from its great resemblance to O. vallata, that it exists within. *Long.* ·045, *long. spir.* ·024, *lat.* ·027, *div.* 22°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 1957 contains the specimen.

493. ODOSTOMIA TENUIS, *n. s.*

O. t. tenui, subconicâ, albâ; vertice nucleoso parvo, decliviter immerso; anfr. iii. *normalibus, subplanatis, suturâ impressâ; peripheriâ haud angulatâ, basi rotundatâ, umbilico conspicuo; aperturâ obovali, peritremati continuo, acuto; labro canali suturali à pariete disjuncto; callositate parvâ in labio columellari vix conspicuo.*

Like O. vallata in the thin continuous peritreme, umbilicus, and slight callosity; differing from the neighbouring species in its rounded periphery and base, and in the sutural canal, which is formed by the separation of the last whirl, not the grooving of the parietal. *Long.* ·064, *long. spir.* ·038, *lat.* ·028, *div.* 22°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1958 contains the largest specimen.

Subgenus AURICULINA, *Gray.*

H. & A. Gen. vol. i. p. 233.

In this group are deposited some shells, having the general aspect of Odostomiæ, but presenting no vestige of a plait, and with the vertex scarcely bent. They are not sufficiently well characterized for description.

494. Auriculina ———, *sp. ind. (a.)*

Tablet 1959 contains 3 imperfect specimens, having the general aspect of O. gravida, *Gould, (Cal. & Mex. Shells,* p. 11, pl. 14, f. 14, Sta Barbara.)

Hab.—Mazatlan; extremely rare, off Spondylus and Chama; *L'pool Col.*

495. Auriculina ———, *sp. ind. (b.)*

Tablet 1960 contains 2 imperfect specimens, white, differing from the last in being much narrower in proportion.

Hab.—Mazatlan; extremely rare, off Chama; *L'pool Col.*

496. Auriculina ———, *sp. ind. (c.)*

Tablet 1961 contains a fragment, like the last, but of a rich orange colour, with a conspicuously sinistral vertex.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Subgenus PARTHENIA, *Lowe.*

Parthenia, *H. & A. Ad. Gen.* i. 233.
Parthenia (pars), *Lowe.*

Shell with the surface somewhat strongly sculptured; columella plaited.

Section A. *Shell thin, turrited, transversely ribbed.*

497. Parthenia scalariformis, *n. s.*

P. t. turritâ, solutâ, albâ; vertice nucleoso parvo, verticaliter sito, pœne immerso; anfr. normalibus v. *elongatis, postice acutius angulatis, liris acutis, in adultâ* ix., *in juniore pluribus,*

transversis, valde extantibus, ad basin continuis; interstitiis subundulatis, lævibus; aperturâ elongatâ, peritremati continuâ, axi plicâ distinctâ munitâ.

Nuclear part very small and sunken; next whirl with numerous, fine, rather undulating ribs; which gradually become less numerous, straight, sharp, and very prominent. Whirls sharply angled at the shoulder, at rather less than 90°. The lip is broken in both specimens, but it is distinctly continuous. There is a general resemblance in form, (though the whirls are less numerous and longer) to Chemnitzia scalaris. *Long.* ·1, *long. spir.* ·065, *lat.* ·37, *div.* 20°.

Hab.—Mazatlan; 2 sp. off Chama; *L'pool Col.*

Tablet 1962 contains the finest specimen.

498. PARTHENIA QUINQUECINCTA, *n. s.*

P. t. formâ "P. scalariformi" simulante; sed vertice nucleoso tumente, anfr. ii., *verticaliter sitis; anfractibus* iii. *et dimidio planatis, æqualiter transversim clathratis; clathris acutis circiter* xiii. *ad suturam antice declivibus, postice muricatis; suturis acute exaratis; lirulis* v. *spiralibus cinctâ, quarum una suturam continuat, altera supra partem declivem, tres in basi sitæ sunt; aperturâ ovali, peritremati continuâ, plicâ parvâ, declivi, intus celatâ, haud umbilicatâ.*

The first normal whirl of this beautiful shell is marked like the rest. The ribs are more numerous than in P. scalariformis, from which it is at once distinguished by the 5 spiral threads, of which 3 appear on the base, one carries on the suture, and the fifth is above it, bounding the slanting portion of the whirls. *Long.* ·063, *long. spir.* ·038, *lat.* ·025, *div.* 20°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1963 contains the finest specimen.

499. PARTHENIA LACUNATA, *n. s.*

P. t. ovali, minimâ, albâ, tenui, subdiaphanâ; vertice nucleoso marginibus spiræ subexcurvatis nequaquam superante, decliviter sito, rotundato, vix tumente, apice celato; anfr. iii. *normalibus clathris circiter* xviii. *solidis tranversis obtusis, munitis; peripheriam versus à lacunâ concavâ, insculptâ interruptis, circa basin ad umbilicum minimum tenue continuis; lacunâ carinis duabus spiralibus cinctâ, quarum una supra suturam, una ad suturam sitæ sunt; interstitiis ad basin tenuissime*

spiraliter striatis, supra lævibus; aperturâ ovali, peritremati vix continuo, plicâ subdistinctâ.

This species is known by the deeply cut channel above the suture, and the transverse bars continued on the other side of the channel in the form of fine lines running round to the minute umbilicus, with the interstices minutely spirally striated. The inner lip is seen best in dead specimens. The labrum is indented by the channel. The number of transverse ribs is variable. *Long.* ·012, *long. spir.* ·024, *lat.* ·023, *div.* 25°.

Hab.—Mazatlan; 7 sp. off Spondylus; *L'pool Col.*

Tablet 1964 contains the largest specimen.

SECTION B. *Shell strong, short, spirally ribbed or nodulous.*

500. PARTHENIA ARMATA, *n. s.*

P. t. ovato-conicâ, solidâ, albâ; vertice nucleoso planato subtumente, anfr. ii., *subprominente, verticaliter sito, marginibus spiræ excurvatis vix superante; anfr.* v. *normalibus, quarum prima lirulis transversis et cingulo basali, alteræ seriebus duabus spiralibus tuberculorum, et carinis duabus acutis instructæ; tuberculis maxime validis* xv.—xx., *serie superiore claviformibus, inferiore subquadratis, in adultâ aperturam versus compressis, pæne evanidis; carinâ unâ majore in peripheriâ, alterâ in basin, parietem plicante; plicâ columellari inferiori; aperturâ ovatâ; labro tenui; suturis impressis.*

This beautiful and highly sculptured species is somewhat analogous to O. gemmulosa, *C. B. Ad. Cont. Conch.* no. 7, p. 109, from Jamaica; from which it differs in the number and strength of the tuberculous ridges. The principal keel falls into the suture of the succeeding whirl. The tubercles are not parallel, being more numerous in the lower row. In the contraction of the lower whirl and thinness of the outer lip, it resembles Chrysallida. *Long.* ·1, *long. spir.* ·076, *lat.* ·034, *div.* 28°.

Hab.—Mazatlan; 12 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1965 contains the most perfect specimen.

501. PARTHENIA EXARATA, *n. s.*

P. t. conicâ, validâ, parvâ, albâ; vertice nucleoso minuto, in parte truncatâ celato; marginibus spiræ subrectis; anfr. iv. *profundissimè exaratis, carinis* iii. *obtusioribus, validissimis*

ornatâ, quarum prima ultimam anfractus superioris tegit ; carinâ quartâ in basin angulatam sitâ ; aperturâ ovali ; labro solido ; plicâ parvâ, celatâ.

This stout little shell is at once recognized by its strong keels, of which two appear on the penultimate whirl, the third being covered by the first of the ultimate. *Long.* ·252, *long. spir.* ·03, *lat.* ·032, *div.* 35°.

Hab.—Mazatlan ; 2 sp. off Chama ; *L'pool Col.*

Tablet 1966 contains the largest specimen.

502. PARTHENIA ZIZIPHINA, *n. s.*

P. t. conicâ, albâ ; vertice nucleoso mammillato ; anfr. liris rotundatis v. *spiralibus, quarum una major ad peripheriam, duæ in spirâ, duæ in basi angulatâ sitæ sunt ; plicâ transversâ.*

Tablet 1967 contains a small Ziziphinus-shaped shell, very young, differing from P. exarata in the number and strength of the spiral ridges. *Long.* ·026, *lat.* ·022.

Hab.—Mazatlan ; 1 sp. on Chama ; *L'pool Col.*

SUBGENUS CHRYSALLIDA.

Testa utrinque constricta, pupiformis ; peritrema continuum, ad basin undatum ; labrum juxta aperturam tenue, intus solidius ; plica columellaris declivis, sæpe celata ; superficies plerumque cancellata. Operculum [sp. typ.] radiatim corrugatum. Chemnitzia, pars, *C. B. Adams, (Pan. Shells,* no. ?220, ?222, 223, 226.)

The typical species differ from Chemnitzia in having a distinct, though hidden plait ; from Odostomia proper in having the peritreme continuous ; from Monoptygma in the Pupiform growth, contracted at each end ; and from all in the labrum, which is extremely thin at the edge, in the adult as well as in the young shell ; while within, as shewn by broken specimens, it is tolerably strong. That the sectional limits are not exactly defined, is true of almost every group in this family. Similar forms occur both in the E. and W. Indies. The Mazatlan shells are represented by 15 species, of which about 650 specimens were found. The specific characters often depend on very minute differences.

SECTION A. *Species Odostomoideæ.*

503. CHRYSALLIDA OVATA, *n. s.*

Chr. t. haud parvâ, solidâ, ovatâ, albâ; vertice nucleoso parvo, omnino celato; marginibus spiræ parum excurvatis; anfr. paucioribus quoad magnitudinem, iv. *et dimidio, subrotundatis; suturâ impressâ; liris tuberculosis transversis, testâ juniore subdistantibus, testâ adultâ contiguis, marginibus spiræ vix parallelis; lirulis spiralibus, in spirâ* iv. *vix monstrantibus, circa peripheriam et basin rotundatas* vi. *validis, rotundatis, interstitiis parvis rugoso-decussatis; aperturâ parum contractâ, peritremati continuo, labio interdum rimulam umbilicalem monstrante; plicâ solidâ, obtusâ, parum celatâ.*

This species and the next are at the confines of the group, with which they agree in general habit, sculpture, and continuous peritreme, while the form is that of the typical Odostomiæ. The pattern closely resembles that of Chr. nodosa, and the apex that of Chr. fasciata, from both of which it differs in its broad expanding form, the adolescent shells being like the adults. The lip is not thin, but agrees with the group in being much more solid within, as is shewn by the broken shells, of which there were several, though very few of any age were perfect. The largest (a monster for the group) measures *long.* ·155, *long. spir.* ·08, *lat.* ·083, *div.* 35°.

Hab.—Mazatlan; very rare, off Spondylus; *L'pool Col.*

Tablet 1968 contains the youngest, the oldest, and an intermediate specimen.

504. CHRYSALLIDA NODOSA, *n. s.*

Chr. t. subconicâ, solidâ, albâ; vertice nucleoso minimo, prominente, marginibus spiræ vix excurvatis parum superante; anfr. normalibus v. *latis, subplanatis; lirulis spiralibus* iv. *transversis usque ad* xvii. *sibi parallelis, ad intersectiones nodosis; tuberculis rotundatis, validis, transversim attingentibus, spiraliter plerumque separatis; lirulis transversis supra suturam impressam declivibus; lirulis spiralibus in basi rotundatâ* vi. *rotundatis, interstitiis tenue decussatis; plicâ columellari parum celatâ, validâ, obtusâ; aperturâ (in t. adultâ) oblongâ, parum contractâ, ad basin productâ, peritremati continuo, labio haud tenui.*

Of this broad and strongly built species, three young shells, one adolescent and one adult were found. It is known at once from Chr. ovata by the prominent little vertex at the head of the pointed spire. The first whirls are very spreading. The base is angulated in the adolescent shell, but rounded in the adult. The base of the columella is produced in all stages, almost notched when young. The labrum is extremely thick in the broken shell. The sutural groove is formed as in Chr. telescopium, but the sculpture most resembles that of Chr. ovata. A young specimen with two and a half normal whirls measures *long.* ·016, *long. spir.* ·022, *lat.* ·034, *div.* 50°.
The adult sp. ,, ·163, ,, ·098, ,, ·072, ,, 30°.

Hab.—Mazatlan; 5 sp. off Spondylus; *L'pool Col.*

Tablet 1969 contains the adult and a young specimen.

505. CHRYSALLIDA ROTUNDATA, *n. s.*

Chr. t. tenuiore, ovatâ, solidâ; vertice nucleoso parvo, planato, verticaliter in medio sitæ, prominente, marginibus spiræ excurvatis parum superante; anfr. iv. *normalibus, tumentibus, suturis conspicuis liris* xi. *spiralibus, solidis, rotundatis, contiguis, quarum* v. *in spirâ sitæ sunt; interdum, maxime in testâ juniore, transversim tuberculosis; interstitiis tenue decussatis; basi rotundatâ; aperturâ parum contractâ, peritremati continuo, labio tenui, plicâ obtusâ, vix eclatâ.*

Of the shape of Chr. ovata, but even more like the normal Odostomiæ; with a very different vertex; and separated from all the other species by the transverse markings being almost obsolete. They appear however here and there, as though to shew the bond of relation. In this species also the young follows the type of the adult. Nine complete shells and a few fragments were found. *Long.* ·09, *long. spir.* ·048, *lat.* ·045, *div.* 35°.

Hab.—Mazatlan; very rare, off Spondylus; *L'pool Col.*

Tablet 1970 contains the youngest, the largest and an intermediate specimen.

506. CHRYSALLIDA OBLONGA, *n. s.*

Chr. testâ ovato-oblongâ, tenuiore, albâ; vertice nucleoso ut in "Chr. rotundatâ;" anfr. v. *normalibus, subconvexis, suturâ distinctâ; liris* v. *in spirâ spiralibus, rotundatis, interstitiis*

minimis, quarum una suprasuturalis simplex, et iv. *tuberculosæ, tuberculis rotundatis, lineis transversis sibi parallelis sitis, in anfr. penult. circiter* xx., *in t. adultâ evanidis; lirulis in basin rotundatam circiter* vii., *t. juniore acutioribus, interstitiis tenuissime et creberrime decussatis; aperturâ ovatâ, peritremati vix continuâ; labro acuto, vix planato, supra suturam producto, ad basin vix sinuato; labio in parietem tenuissimo, infra distincto, rimulam umbilicalem formante; plicâ intus acutâ, extus obtusâ, haud conspicuâ.*

This fine species approaches Monoptygma. It differs from Chr. rotundata in the tuberculation of the spiral ribs and the much greater prolongation of the shell. The basal striæ seem to become broader in the adult, as the tuberculation of the upper ribs vanishes. The young shells are slender, with rounded bases. The tubercles are arranged in the form of transverse ribs, parallel to each other, and running in slanting lines to the apex. *Long.* ·153, *long. spir.* ·095, *lat.* ·067, *div.* 22°.

Hab.—Mazatlan; 4 sp. and fragment, off Spondylus; *L'pool Col.*

Tablet 1971 contains the largest sp. presented by R. D. Darbishire, Esq. and a very young shell which may belong to this species.

SECTION B. *Species typicæ.*

507. CHRYSALLIDA COMMUNIS, *C. B. Ad.*

Chemnitzia communis, *C. B. Ad. Pan. Shells*, no. 223, pp. 166, 312.

Chr. t. ovato-oblongâ, gibbosâ, solidiore, nitente, albâ; vertice nucleoso parvo, spiræ truncationem dimidio tegente, anfr. ii. *verticaliter sitis, apice vix celato; marginibus spiræ maxime excurvatis; anfr. normalibus* iv.—vi, *planatis, suturâ profundâ; clathris transversis, utrinque marginibus spiræ parallelis, testâ juniore conspicuis, aperturam versus evanescentibus, juxta peripheriam terminantibus, anfr. penult. circiter* xxii.; *liris spiralibus* iv. *vel* v. *suprasuturalibus, anfr. primis minoribus, anfr. ultimis sæpe clathras in tubercula secantibus; lirulis rotundatis vix expressis circiter* x. *supra basin ovatam interstitiis punctulis decussatis; sculpturâ in labro tenuissimo, diaphano evanescente; labro antice late sinuato, postice planato angustato, ad suturam constricto, labio sæpe à pariete separato;*

plicâ declivi intus conspicuo extus ad labrum sinuatum circumeunte; operculo tenuissimo, vix spirali, striulis rugosis radiantibus ornato.

As no fewer than 500 specimens were found of this typical species, (a rare number for a Pyramidellid,) most of them in very fresh condition, it is possible to describe it with tolerable accuracy. It is distinguished from its neighbours by the basal striæ which are numerous, close and fine, beautifully adorned between with dots more or less elongated. The outer lip is produced and broadly indented at the base, narrow above and pinched at the suture, where it joins the labium which is often rather separate from the body whirl. The plait winds round the axis and develops into the boundary of the basal sinus. The sutural groove is not carried over the base, but is formed simply by the transverse ribs ending just before they reach the next whirl. These are not parallel to each other, but to the diverging outlines of the spire. They are very conspicuous on the young shell, which is broad and rather angulated at the periphery. As the adult shell narrows itself in, the base is produced and rounded, the ribs become somewhat indented by the spiral lines, and near the mouth fade away altogether. In the adolescent state the labrum is often beautifully serrated by the spiral striæ; in the adult the lip is still transparent in the living shell. Its great thinness causes it to be frequently broken and repaired, the fresh part being not unfrequently almost devoid of sculpture. The spire is sometimes encrusted with coralline during the life of the animal. The operculum, (traces of which were observed in only about a dozen specimens,) is large, extremely thin, transparent, sometimes shewing a slightly spiral element, and covered over almost the whole surface with most minute wrinkles, radiating in curves from the centre like the engine-turning of a watch. Not only the size, but the number of whirls varies in different specimens known to be adult by the shape and evanescence of the sculpture. Very few are so large as those from Panama, and they generally make one turn less. The smallest specimen measures ·03 by ·021; the smallest adult, ·053 by ·025; an unusually large one, *long.* ·12, *long. spir.* ·085, *lat.* (in med.) ·048, *div.* 23°.

Hab.—Panama; 90 sp. under stones near low water mark; *C. B. Adams.*—Mazatlan; abundant and fresh among algæ on Uvanilla, somewhat rare on Chama, Spondylus, &c.; *L'pool & Havre Coll.*

Tablet 1972 contains 9 sp. very young.—1973, 8 do. adolescent.—1974, 9 do. adult, various sizes.—1975, 3 do. repaired after fracture.—1976, 2 sp. with opercula.—1977, 1 sp. beautifully encrusted, another with broken lip shewing the fold within; and 2 dead sp. in which state the details of sculpture are conspicuously marked.

508. CHRYSALLIDA TELESCOPIUM, *n. s.*

Chr. t. conicâ, turritâ, albâ; vertice nucleoso, satis prominente, anfr. ii. *helicoideos verticaliter sitos continente, apice parum monstrante, marginibus spiræ (testâ adolescente) rectis vix superante; anfr.* vii. *normalibus, quorum* v. *planati, in spirâ, ut in "Chr. communi," clathris circiter* xvi. *et lirulis spiralibus* iv. *decussatis: testâ adolescente, lacunâ suturali impressâ circa basin continuâ; peripheriâ angulatâ, aperturâ subquadratâ; testâ adultâ, basi haud angulatâ, effusâ, haud lacunatâ; peritremati continuo, ad basin late sinuato: basi lirulis spiralibus circiter* vii. *cinctâ, intersitiis vix decussatis; plicâ columellari intus acutâ, prominente, ad aperturam vix monstrante, declivi.*

This species begins life as a helicoid body, rather large in proportion as in Chemnitzia, which genus it also approaches in the number of whirls. These are flat, with straight margins, having the basal periphery angulated in the adolescent shell, in which state it approaches the form of Telescopium. The sutural groove, formed by the hollowing off of the ribs in the last cancellated division, is then continued round the base. In the last whirl however, the shell is contracted, the base produced, the sutural groove evanescent, the aperture effuse, and a strong continuous labium finally appears. It is known from Chr. communis by the large size of the vertex, taking off the appearance of truncation from the shell; in the non-adult state by the greater angulation of the base and antesutural groove (the ribs in the common species not quite reaching the suture); and in all states by the greater divergence, and by the basal striæ, which are stronger and less numerous. A specimen in the angular state measures *long.* ·082, *long. spir.* ·055, *lat.* ·037, *div.* 30°. One almost adult measures *long.* ·125, *long. spir.* ·085.

Hab.—Mazatlan; 10 specimens (mostly young) off Chama and Spondylus; *L'pool Col.*:—do. 3 sp. (one adult); *Havre Col.*

Tablet 1978 contains the youngest sp., with two and a half normal whirls; an angular specimen with 5 whirls; a perfect sp. with 6 whirls, normal form, but without the parietal lip;

and a broken adult sp. shewing the lip. This, when perfect, must have had 7 normal whirls. [One of Mr. Hanley's specimens, though small, has the peritreme continuously developed, and shaped as in Chr. communis.]

509. CHRYSALLIDA REIGENI, *n. s.*

Chr. t. formâ et sculpturâ "Chr. telescopio" simulante, sed basi rotundatâ, vertice nucleoso ut in "Chr. fasciatâ" celato.

One specimen only, somewhat broken and immature, was found of this species, which is named in remembrance of the gentleman to whose almost unparalleled zeal we owe the immense collection, a very small part of which is here described. A minute umbilical chink is seen, probably from a fracture of the labium over one of the basal striæ. *Long.* ·057, *long. spir.* ·034, *lat.* ·028, *div.* 26°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 1979 contains the specimen.

510. CHRYSALLIDA EFFUSA, *n. s.*

Chr. t. ovoideâ, albidâ, effusâ; marginibus spiræ excurvatis; vertice nucleoso?...; anfr. ?iv. *parum planatis, lirulis spiralibus acutis* viii. *cinctâ, quarum* iv. *in spirâ, à lirulis transversis, sibi parallelis, in lineis declivibus ad verticem ascendentibus, acutioribus, decussatæ, ad intersectiones nodosæ; una extans suturam continuat; alteræ in basin valde productam; striulis* iii. *ad regionem umbilicalem; lirulis transversis juxta suturam impressam declivibus, evanescentibus; interstitiis basalibus latis distanter tenuissime decussatis; labro ad basin valde sinuato, effuso; plicâ celâtâ, parvâ, acutâ.*

Of this species, the most delicately sculptured in the group, only one not quite mature specimen was found, the vertex of which is unfortunately injured. The transverse riblets are parallel to each other, not to the margins of the whirls, and vary in number accordingly. The structure of the sutural groove is as in Chr. telescopium. *Long.* ·09, *long. spir.* ·054, *lat.* ·038, *div.* 20°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 1980 contains the specimen; also a very young shell, with a sunken apex, which might have developed into this species or into a slender form of Chr. fasciata.

511. CHRYSALLIDA FASCIATA, *n. s.*

Chr. t. parvâ, ovoideâ, albâ; vertice nucleoso parvo, declivi, omnino celato; marginibus spiræ excurvatis; anfr. normalibus iv.—v., *clathris circiter* xviii. *tuberculosis, lirulis* iii. *plus minusve conspicuis, decussantibus, cingulo quoque super suturam extante, interstitiis utrinquè tenue decussatis, ornatâ; basi rotundatâ lirulis circiter* iv. *spiralibus subacutis cinctâ, interstitiis latis, lineis clathra continuantibus tenue decussatis; plicâ columellari celatâ, parvâ, obtusâ; peritremati vix continuo, labio tenui.*

This species has some characters in common with Chr. marginata, *C. B. Ad. (Pan. Shells*, no. 226) from which the number of ribs at once distinguishes it. In many respects it resembles Chr. ovulum, from which it differs in its breadth and larger size, in the prominence of the suprasutural band, the fineness of the few basal striæ, and the sunken position of the nuclear whirls on the broadly truncated (·01 across) spire. Some of the specimens are short and broad in proportion, which is the character of the earlier stage generally. A young shell, with two and a half normal turns, measures *long.* ·036, *long. spir.* ·017, *lat.* ·027, *div.* 80°. The largest, unusually elongate, yet not quite mature, *long.* ·083, *long. spir.* ·046, *lat.* ·042, *div.* 23°.

Hab.—Mazatlan; 20 sp. off Spondylus; *L'pool Col.*

Tablet 1981 contains 5 specimens; two very young, one dwarf, one mature, broad, and one almost mature, elongated.

512. CHRYSALLIDA OVULUM, *n. s.*

Chr. t. minimâ, gibbosâ, albâ, solidiore; vertice nucleoso "Chr. communi" simulante, marginibus spiræ valde excurvatis, haud superante; anfr. normalibus iii. *et dimidio, interdum clathrulis transversis circiter* xviii., *interdum lirulis spiralibus* iv. *nodulosis superantibus; lacunâ suturali profundâ, in basin rotundatam, effusam, haud continuâ; aperturâ compactâ, labro parum tenui, intus solido; plicâ columellari obtuso; lirulis rotundatis in basin spiralibus circiter* vi., *interstitiis minimis, vix decussatis.*

About 70 specimens of this stumpy little species were found, differing from the dwarf forms of Chr. communis in the strength of the spiral riblets, which generally break the transverse bars into coarse tubercles, and in the small number and prominence of the rounded basal striæ. The whirls are very few,

sometimes not more than two and a half in the adult. A ? variety has the sculpture much finer. A large sp. measures *long.* ·055, *long. spir.* ·032, *lat.* ·027, *div.* 25°.

Hab.—Mazatlan; not common, off Spondylus and Chama; *L'pool Col.*

Tablet 1982 contains 9 specimens in different stages.

Section C. *Species Chemnitziformes.*

513. Chrysallida clathratula, *C. B. Ad.*

Chemnitzia clathratula, *C. B. Ad. Pan. Shells,* p. 165, 311, no. 222.

This species passes into the rounded cancellated forms of Chemnitzia, (Subgenus Dunkeria,) from which it is known by the distinct fold on the columella, and continuous peritreme. The last whirl is but slightly contracted. It is known at once from the rest of the Chrysallidæ by its very elongated form and rounded whirls. The solitary Mazatlan specimen has lost its upper portion; but the imperfection of the aperture brings to light the oblique distinct columellar plait, which escaped the notice of Prof. Adams.

Hab.—Panama; 10 sp. in sand; *C. B. Adams.*—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 1983 contains the specimen.

514. Chrysallida convexa, *n. s.*

Chr. t. gracili, tereti, tenui, albidâ; vertice nucleoso anfr. ii. *helicoidalibus, magnis, declivibus, marginibus spiræ, parum excurvatis, superantibus, quarum apex in anfr. normali primâ horizontaliter jacet, parum prominens; anfr. normalibus* v. *valde convexis, liris obtusis circiter* xiv. *radiantibus, ad suturam profundam sæpius attingentibus, circa basin evanescentibus; lirulis spiralibus in partem anteriorem anfractuum, interstitia tenue decussantibus, quarum* iii. *in spirâ videntur, circa basin satis rotundatam plures; aperturâ subovali, parum contractâ; columellâ oblique plicatâ; labio tenui.*

This remarkable shell has the apex and growth of a Chemnitzia, the convex whirls of Aclis, with the spiral plait and (slightly contracted) aperture of Chrysallida. The lower half

only of the whirls is spirally sculptured. *Long.* ·081, *long. spir.* ·061, *lat.* ·025, *div.* 14°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1984 contains the largest specimen. A hole behind displays the plait.

515. CHRYSALLIDA PHOTIS, *n. s.*

Chr. t. albidâ, gracili, solute spirali; vertice nucleoso ut in "Chr. convexâ" sito, sed multum minore, marginibus spiræ balde excurvatis haud superante; anfr. normalibus iv. *valde convexis, ut in "Phote" cancellatis, liris transversis nodosis* xii. *ad suturas valde impressas attingentibus, decliviter ad verticem ascendentibus, ad basin continuis; lirulis spiralibus supra liras nodosis, inter eas eleganter undulatis, quarum* iv. *in anfr. penult. apparent; anfr. ult. contracto; aperturâ continuâ, ovali, postice contractâ; plicâ obliquâ, celatâ.*

This very elegant little shell is sculptured as in Phos, with the tumid whirls of Aclis, the apex of Chemnitzia, and the aperture of Chrysallida. The plait is scarcely seen in the perfect shell, but conspicuous in the broken one. *long.* ·049. *long. spir.* ·032, *lat.* ·019, *div.* 12°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1985 contains the perfect specimen.

516. CHRYSALLIDA INDENTATA, *n. s.*

Chr. t. obtusiore, albâ, subconicâ; vertice nucleoso helicoideo, satis magno, marginibus spiræ rectis vix superante, haud prominente, anfr. ii. *globosis, subverticaliter sitis, apice conspicuo; anfr. normalibus subconvexis, ad suturam impressam à liris submuricatis; liris acutis, subrectis, circiter* xviii. *infra suturam subindentatis; testâ juniore ad peripheriam pæne evanidis, lineis circa basin vix conspicuis; striis spiralibus, in spirâ circiter* v. *interstitia decussantibus, eleganter undulatis; circa basin striis crebrioribus, inter lineas transversas undulatis; t. adultâ, liris circa basin continuis, sculpturâ spirali superantibus; aperturâ pyriformi, continuâ, postice contractâ; labro ad basin vix effuso; labio separato; columellâ haud contortâ; ? plicâ celatâ.*

The completion of the peritreme, and absence of the twisted columella distinguish this species from Chemnitzia; but no plait can be discerned either in the young or old specimen which are both quite perfect. A broken specimen would probably display it. The species is characterized by the sharp ribs, indented at the suture, with the interspaces elegantly decussated with curved lines. The young shell, with 4 normal whirls, measures *long.* ·062, *long. spir.* ·037, *lat.* ·032, *div.* 30°. Adult, with 7 whirls „ ·153, „ ·113, „ ·05, „ 18°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 1986 contains the adult specimen.

517. ?? CHRYSALLIDA CLAUSILIFORMIS, *n. s.*

?? Chr. t. valde elongatâ, effusâ, spirâ "Clausiliæ" dextræ simulante; vertice nucleoso helicoideo, anfractibus ii. *et dimidio, prominente, verticaliter sito, ab anfractibus normalibus separato; marginibus spiræ valde excurvatis; anfr. normalibus duobus primis valde tumentibus, vix attingentibus; dein anfr.* v. *subplanatis, suturis expressis, fasciâ bipartitâ, interdum subnodulosâ; lirulis obsoletis transversis, et striis spiralibus circa basin effusam indistincte ornatâ; totâ superficie minutissime transversim rugulosâ; aperturâ oblongâ, ad basin valde effusâ; plicâ obliquâ, subacutâ; operculo paucispirali, tenuissimo, rugulis curvatim radiantibus instructo.*

This most aberrant species is placed here from some of its characters; others are so peculiar to itself as almost to justify its sectional separation. Its form is that of a dextral Clausilia, with the apex of a very acute Chemnitzia, the nearly smooth surface of Eulimella, and the fold, the operculum, and the constricted mouth of Chrysallida. The peculiarities are the separation and tumidity of the first two normal whirls, and the structure of the suture. This, instead of being impressed, has a slight raised deposit in each whirl, which meets its neighbour like the rims of two plates. All the four specimens found were imperfect and disintegrating; in one of them however the operculum, as well as the vertex, were preserved. The largest must have measured when perfect, *long.* ·15, *long. spir.* ·095, *lat.* ·045, *div.* 20°.

Hab.—Mazatlan; 4 sp. off Chama; *L'pool Col.*

Tablet 1987 contains the least imperfect specimen, with its operculum.

Genus CHEMNITZIA, *D'Orb.*

Nat. Hist. Canar. 1839.—*Forbes & Hanl. Br. Moll.* vol. iii. p. .—*Woodw. Man. Moll.* p. 126.
Turbonilla, *Risso, Nat. Hist. Eur. Mér.* vol. iv. p. 224, 1826.—*Phil. Handb. Conch.* p. 193.—*H. & A. Ad. Gen.* vol. i. p. 230.
Parthenia, *Lowe, Ann. Mag. Nat. Hist.* vol. vi. p. 511, 1841.
Pyrgiscus, *Phil. Arch. f. Nat.* vol. i. p. 50, 1841.
Pyramis + Jaminea, *Brown, Brit. Conch.*
Amoura, *Müll.*
Orthostelis, *Arad. & Magg. Cat. Reg.* p. 189, ? 1844.

Species typicæ. *Anfractibus planatis.*

Section A. *Without spiral sculpture.*

(a.) Ribs interrupted at the periphery.

518. Chemnitzia ? Panamensis, *C. B. Ad.*

Pan. Shells, no. 227, pp. 168, 312.

Tablet 1989 contains a dead specimen which appears sufficiently like the type in Mr. Cuming's Collection. It has 5 whirls, the apex being deficient both in this and in the type. The species is rather broad, with very flat whirls, stout, rather slanting ribs, and very deeply cut grooves as far as the periphery. It measures *long.* ·075, *lat.* ·025.

Hab.—Panama; 11 sp. in the sand on the reef, between high water and half tide levels; *C. B. Adams.*—? Mazatlan; 1 sp. off Chama; *L'pool Col.*

519. Chemnitzia C-B-Adamsii, *n. s.*

Ch. t. gracili, albâ, elongatâ; vertice nucleoso anfr. iii. *prominentibus, declivi, marginibus spiræ rectis superante; anfr.* ii. *prope apicem rotundatis; deinde* vii. *planatis, suturâ impressâ; liris circiter* xviii. *rectis, solidis, obtusis, ad peripheriam subito obsoletis; basi subrotundatâ; labro tenui; columellâ tenui, vix intortâ.*

Shell intermediate between Ch. aculeus and Ch. Panamensis, with all the whirls except those next the apex flattened. The apex is very large, with 3 tumid whirls, set rather slanting on the axis. It is named in remembrance of Prof. Adams of Amherst, U. S. whose early death has deprived science of one

her most accurate and careful labourers. *Long.* ·15, *long. spir.* ·125, *lat.* ·036, *div.* 11°.

Hab.—Mazatlan; 12 sp. off Chama & Spondylus; *L'pool Col.*

Tablet 1990 contains the finest specimen.

520. CHEMNITZIA ?SIMILIS, *C. B. Ad.*

Pan. Shells, no. 228, pp. 168, 312.

There being no type of this species in Mr. Cuming's collection, it is determined with doubt. It is described as differing from Ch. Panamensis in being shorter, with the whirls rather more convex, and the periphery rounder. The apex has 3 turns, and projects beyond the margins of the spire. The largest specimen, which has nine whirls, and is beautifully translucent, measures *long.* ·072, *lat.* ·028, *div.* 20°.

Hab.—Panama; 2 sp. in the sand; *C. B. Adams.*—? Mazatlan; 6 young sp. off Chama and Spondylus; *L'pool Col.*

Tablet 1991 contains the finest specimen.

521. CHEMNITZIA ACULEUS, *C. B. Ad.*

Pan. Shells, no. 219, pp. 164, 311.

Shell extremely slender, but with the upper whirls not nearly so pointed as in C. gracillima. The apex in Mr. Cuming's type specimen has 3 turns and slightly projects beyond the line of the whirls. These are scarcely convex, with 14—17 stout ribs formed by the scooping out of smooth interstices which end on the periphery. The largest specimen, with ten whirls, measures *long.* ·13, *long. spir.* ·108, *lat.* ·03, *div.* 12°.

Hab.—Panama; 4 sp. in sand; *C. B. Adams.*—Mazatlan; 6 do. off Chama and Spondylus, dead; *L'pool Col.*

Tablet 1992 contains the least worn of the specimens.

522. CHEMNITZIA MURICATA, *n. s.*

Ch. t. satis gracili, albâ, subdiaphanâ; vertice nucleoso anfr. iii., *rotundatis, marginibus spiræ rectis vix superante, tumente; anfr. normalibus* vii. *angustis, planatis, clathratis; liris circiter* xvii. *solidis, rectis, vix declivibus, plerumque lineis ad apicem decurrentibus; suturâ impressâ; liris ad suturam prominentibus, muricatis; interstitiis usque ad peripheriam*

profunde excavatis; basi lævi, rotundatâ; labro tenui; columellâ eleganter inflexâ.

This beautiful little species closely resembles Ch. turrita, *C. B. Ad. Pan Shells*, no. 230, pp. 169, 312; from which it differs in the entire absence of spiral keels at the base. The apical whirls are extremely tumid; the rest are all flat, compact, and somewhat muricated at the sutures by the projecting ribs. *Long.* ·09, *long. spir.* ·07, *lat.* ·027, *div.* 13°.

Hab.—Mazatlan; 5 sp. off Spondylus; *L'pool Col.*

Tablet 1993 contains 2 sp. differing in texture, and in the position of the apex, but probably conspecific.

(b.) Ribs more or less continuous over the base.

523. CHEMNITZIA ?AFFINIS, *C. B. Ad.*

Pan. Shells, no. 221, pp. 165, 311.

Although this species is described as "very smooth anteriorly," the type specimen in Mr. Cuming's collection is distinctly striated spirally round the base, over which there is a very faint indication of the ribs: apex scarcely projecting, of two whirls. The Mazatlan specimen is rubbed; it has seven whirls and measures *long.* ·068, *lat.* ·03, *div.* 20°.

Hab.—Panama; 2 sp. in the sand; *C. B. Adams.*—?Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 1994 contains the specimen.

524. CHEMNITZIA PROLONGATA, *n. s.*

Ch. t. elongatâ, gracili, tereti, albidâ; vertice nucleoso anfr. ii. *helicoideis, marginibus spiræ subrectis haud superante; anfr. normalibus* xi. *subconvexis, suturis impressis; costis subacutis circiter* xxii., *haud continuis, vix declivibus, ad basin tenue prolongatis, ad rimulam umbilicalem ascendentibus; aperturâ ovatâ; labro acuto; columellâ eleganter intortâ.*

This graceful species, a little group of which was discovered in a cavity on Spondylus by Mr. Darbishire, is distinguished from similar West coast species by the faint prolongation of the rather slender ribs over the base to the umbilical chink formed by the slight twisting of the columella. The nuclear vertex is not broader than the next whirl. An adult specimen measures *long.* ·215, *long. spir.* ·175, *lat.* ·05, *div.* 13°.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 1995 contains a specimen presented by R. D. Darbishire, Esq.

(c.) Gibbous and uncertain species.

525. CHEMNITZIA GIBBOSA, *n. s.*

Ch. t. pupiformi, rufo-fuscâ, spiræ marginibus utrinque excurvatis; vertice nucleoso ?... ; anfr. normalibus x., *planatis; liris transversis subexpressis, subrotundatis, rectis, circiter* xviii. *ad apicem continuis; labro ?.....*

This species is described, although from a solitary and very imperfect specimen, in consequence of its great peculiarity of form, in which it resembles Chrysallida. It is short, stumpy, and very broad; without any trace of fold on the columella or notch on the base. *Long.* ·27, *lat.* ·1, *div.* 25°.

Hab.—Mazatlan; off Chama, extremely rare; *L'pool Col.*

Tablet 1996 contains all that was found, viz. the broken specimen, and a fresh fragment displaying sculpture.

526. CHEMNITZIA ———, *sp. ind. (a.)*

Tablet 1997 contains the spire of a very stout shell, with about 12 very stout ribs on each whirl, running in continuous diagonal lines to the apex. There is no trace of columellar plait.

Hab.—Mazatlan: 2 sp. off Spondylus; *L'pool Col.*

527. CHEMNITZIA ———, *sp. ind. (b.)*

Tablet 1998 contains the spire of a Eulimoid shell, of alabastrine texture, with about 20 extremely faint ribs, running in diagonal lines to the apex. It is not so broad as the last species.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

528. CHEMNITZIA ———, *sp. ind. (c.)*

Tablet 1999 contains a very small specimen of a large species, too young to identify, as it has only one normal whirl and a half, strongly shouldered, and with numerous very fine ribs in the upper part. The sinistral portion is large, and the junction of the two is very conspicuous. *Long.* ·035, *lat.* ·019.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

B. *Whirls with spiral sculpture.*

(a.) Ribs interrupted at the periphery.

529. CHEMNITZIA ———, *sp. ind. (d.)*

Tablet 2000 contains a fragment of a very large, white, subdiaphanous species, with deep grooves between ribs ending at the periphery. The mouth must have been ·08 long.

Hab.—Mazatlan; fragment, off Spondylus; *L'pool Col.*

530. CHEMNITZIA GRACILLIMA, *n. s.*

Ch. t. juniore acutissimâ, maxime elongatâ; vertice nucleoso prolongato, marginibus spiræ incurvatis? superante; anfr. primis solutis, rotundatis; postea subplanatis; costis circ. xvi. *obtusis, circa peripheriam subito truncatis; basi rotundatâ, lævi; interstitiis spiraliter tenue decussatis; aperturâ elongatâ; columellâ vix intortâ.*

In most Chemnitziæ, even if the spire outlines are nearly parallel in the adult, they are divergent when young. In this, the upper whirls are the sharpest, and scarcely overlap each other. The nucleus appears to have been very large. A worn, dead sp. appears even sharper than that here measured, with fewer ribs. The larger sp. with eight normal whirls, measures *long.* ·117, *long. spir.* ·085, *lat.* ·008—·035, *div.* 13°.

Hab.—Mazatlan; 2 sp. off Chama; *L'pool Col.*

Tablet 2001 contains the larger specimen.

(b.) Ribs evanescent at the base.

531. CHEMNITZIA UNDATA, *n. s.*

Ch. t. gracili, tenui, albido-fuscâ; vertice nucleoso marginibus spiræ subrectis superante; anfr. (teste juniore) vii. *subplanatis, suturâ profundâ; liris tenuissimis circiter* xviii. *acutis, vix expressis, circa basin evanidis, interstitiis latis, undatis; striulis spiralibus totam superficiem ornantibus, striâ majore circa peripheriam; labro acuto; columellâ gracili, vix tortâ.*

On comparing this shell with the corresponding portion of C. gracilior, *C. B. Ad.*, it is found to have many fewer and much finer and sharper ribs, which do not end at the periphery, like the curved interspaces. *Long.* ·065, *long. spir.* ·045, *lat.* ·022, *div.* 14°.

Hab.—Mazatlan; 2 young perfect sp. off Spondylus; *L'pool Col.*

Tablet 2002 contains the larger specimen; the smallest is of a much darker colour.

532. CHEMNITZIA FLAVESCENS, *n. s.*

Ch. t. gracillimâ, tereti, flavescente; vertice nucleoso helicoideo, marginibus spiræ rectis valde superante, anfr. iii. *globosis, verticaliter sitis, apice conspicuo; anfr. normalibus subplanatis, lirulis rectis circiter* xx. *minime expressis, vix acutis, ad basin evanidis; striulis circa basin rotundatam spiralibus; punctulis creberrimis interstitia decussantibus, sæpe elongatis; aperturâ ?.....*

One somewhat imperfect specimen only of this species was found by Mr. Hanley. It is intermediate between C. gracilior, (*C. B. Ad. Pan. Shells*, p. 167, no. 224,) and C. undata. It is however more slender than either, and differs from the first in the very large size of the sinistral apex, and in the flattening of the early whirls, which in C. gracilior are much swollen in the early stage, though afterwards they are normally flattened. The ribs are also fainter, and the interstitial spiral grooving more decided. The specimen presents six normal whirls and measures *long.* ·11, *lat.* ·032, *div.* 13°. The sinistral apex is fully ·01 across.

Hab.—Mazatlan; 1 sp. off Spondylus calcifer; *Havre Col.*

Tablet 2003 contains the specimen, kindly presented by S. Hanley, Esq.

533. CHEMNITZIA TEREBRALIS, *n. s.*

Ch. t. "*Ch. tenuiliratæ*" *simili, sed curtiore, compactâ; liris paucioribus (circiter* xx.) *ad basin evanidis, supra extantibus, suturam profundam coronantibus; columellâ ad basin productâ; labro ad suturam emarginato.*

A much shorter and broader shell in proportion than C. tenuilirata, stronger, with the ribs evanescent below the periphery, and muricating the suture; they are not in continuous lines. There is a slight slit at the suture, as in Terebra, and an approach to an angle at the base of the columella. The shell, which has 8 whirls, measures *long.* ·097, *long. spir.* ·071, *alt.* ·035, *div.* 20°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 2004 contains the specimen.

(c.) Ribs continuous over the base.

534. CHEMNITZIA TENUILIRATA, *n. s.*

Ch. t. elongatâ, angustâ, albidâ ; vertice nucleoso haud extante, marginibus spiræ rectis haud superante ; anfr. (testâ juniore) vi., *planatis, suturâ angustâ, distinctâ ; lirulis circiter* xxiv. *rectis, à basi ad apicem ascendentibus, circa basin continuis ; interstitiis lineis curvatis decussatis ; labro acuto, labio tenui, columellâ gracili.*

The species is described from a perfect young and a broken adult specimen. The latter, when complete, must have measured about ·23. The young one measures *long.* ·065, *long. spir.* ·045, *lat.* ·027, *div.* 15°: (*t. adultâ*, 11°.)

Hab.—Mazatlan ; 2 sp. off Spondylus ; *L'pool Col.*

Tablet 2005 contains both specimens.

535. CHEMNITZIA UNIFASCIATA, *n. s.*

Ch. t. tereti, angustâ, flavescente, fasciâ densius coloratâ in medio anfractuum spiram ascendente ; vertice nucleoso helicoideo, satis magno, marginibus spiræ rectis vix superante, haud prominente, anfr. ii. *subglobosis, verticaliter sitis, apice parum conspicuo ; anfr. normalibus planatis, suturâ haud conspicuâ ; lirulis minimis rectis, acutis, circiter* xx. *circa basin prolongatam rotundatam continuis ; striulis spiralibus decussantibus, in spirâ* iv., *in basi crebrioribus ; aperturâ elongatâ ; columellâ vix contortâ ; labio valido.*

The spiral band of colour can only just be seen in a good light, the shell probably being dead ; but it is the only Mazatlan species which possesses the character. In some respects it resembles the W. Indian Ch. reticulata, *C. B. Ad.* : but the upper whirls are much flatter. The only specimen found has 5 normal whirls, and measures *long.* ·09, *long. spir.* ·05, *lat.* ·025, *div.* 18°.

Hab.—Mazatlan ; 1 sp. off Spondylus ; *L'pool Col.*

Tablet 2006 contains the specimen.

SUBGENUS DUNKERIA.

Chemnitzia, anfractibus tumidis, decussatis.

This group combines the characters of Chemnitzia and Aclis, presenting the mouth of the former with the rounded whirls

of the latter. It agrees with all the other sections of the family in having its limits badly defined. When the forms from various seas are better known, the entire family will need revision; meanwhile, for convenience' sake, these species are separated with a name in remembrance of Prof. W. Dunker, the learned author of *Ind. Moll. Guin.*, *Monogr. Mytil.* &c.

536. DUNKERIA PAUCILIRATA, *n. s.*

D. t. turritâ, solidiore, albâ; vertice nucleoso haud producto, marginibus spiræ rectis haud superante; anfr. rotundatis, postice subangulatis, suturis profundis, lirulis acutis circiter xiv. *interstitiis latis, undatis, spiraliter tenuissime striatis; aperturâ elongatâ, subquadratâ.*

This species somewhat resembles Parthenia scalariformis, but is entirely destitute of the columellar plait. The last whirl has perished: the remaining six measure *long.* ·083, *long. spir.* ·055, *lat.* ·027, *div.* 15°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 2007 contains the specimen.

537. DUNKERIA SUBANGULATA, *n. s.*

D. t. subcylindricâ, albâ; vert. nucl. globoso, valde declivi, vix prominente, anfr. iii., *apice pæne celato, marginibus spiræ subexcurvatis haud superante; anfr. normalibus* v. *convexis, infra suturam valde profundam vix angulatis; lirulis transversis tenuibus circiter* xx., *ad suturam interdum continuis, ad basin evanidis, à striis spiralibus, parum elevatis, in anfr. penult.* iv. *eleganter cancellatis, interstitiis quadratis; striis circa basin rotundatam magis extantibus, tenuissime in lineis lirularum cancellatis; aperturâ subovali.*

Variat, t. minore, liris exilioribus, crebrioribus.

The outline of this elegantly cancellated species, when young, resembles D. paucilirata: it is then however much broader and more angulated, with more numerous ribs, and a scarcely twisted columella. In the adult state the lirulæ, which cease at the suture, are continued round the base, in the form of minute lines decussating the spiral striæ, as these decussate the ribs above. A very young sp. with two normal whirls measures ·032 by ·023. The largest in the L'pool Col. with four normal whirls, measures *long.* ·067, *long. spir.* ·015,

lat. ·027, *div.* 18°. Mr. Hanley however found four specimens, each with five whirls, the largest of which measures ·113 by ·037. *Hab.*—Mazatlan; extremely rare, off Spondylus; *L'pool & Havre Coll.*

Tablet 2008 contains the youngest sp.; and an adult, presented by S. Hanley, Esq.

538. DUNKERIA CANCELLATA, *n. s.*

D. t. juniore effusâ, rufo-fuscâ, anfr. normalibus ii *et dimidio, valde tumentibus, vix attingentibus, superne angulatis; vertice nucleoso tumente, helicoideo, anfr.* ii. *verticaliter sitis; lirulis plurimis transversis acutissimis, et spiralibus minoribus elegantissime cancellatâ; labro angulato; labio rimulam umbilicalem circumeunte; plicâ columellari nullâ.*

This exquisitely beautiful young shell looks like an elongated Cancellaria without plaits; it is shouldered as in C. goniostoma. The sinistral apex is very prominent. When adult, it must be of surpassing elegance. *Long.* ·038, *long. spir.* ·02, *lat.* ·02, *div.* 15°.

Hab.—Mazatlan; 1 young sp. off Spondylus; *L'pool Col.*

Tablet 2009 contains the specimen.

539. DUNKERIA INTERMEDIA, *n. s.*

D. t. albâ, elongatâ, tenui: vertice nucleoso maximo, anfr. iii. *helicoideis, verticaliter sitis, prominentibus, apice conspicuo, marginibus spiræ superantibus; anfr. primis normalibus convexis, dein subplanatis; striis spiralibus omnino ornatâ, tenuibus, obtusis, quarum circiter* vii. *in spirâ apparent; striulis tenuibus minoribus transversis evanescentibus vix decussatâ; interdum, lirulis evanescentibus irregularibus; basi subelongatâ; aperturâ ovali; columellâ vix contortâ.*

This species is described, although from a single young specimen and a broken adult, in consequence of its aberrant sculpture, which is more appropriate to Aclis, while the shape of the aperture is characteristically Chemnitzian. The transverse ridges are only represented, in the young shell by very faint threads, most conspicuous at the sutures, while the spiral, somewhat flattened lines are prominent. The young specimen has only 3 normal whirls, and measures *long.* ·055, *lat.* ·027, *div.* 12°. The adult, which has lost the lower whirls, has the

decussating transverse threads, extremely faint; but displays very slight riblets near the suture, nearly obsolete over the body of the whirl.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 2010 contains the younger specimen.

Genus EULIMELLA, *Forbes.*

Forbes & Hanl. Br. Moll. vol. iii. p. 308.—*H. & A. Ad. Gen.* vol. i. p. 233.
Chemnitzia, pars, *Clark, Möll. Mar. Ins. Brit.* p. 540, &c.

540. ?Eulimella obsoleta, *n. s.*

Eu. t. valde elongatâ, albo-fuscâ; lirulis minimis transversis infra suturam monstrantibus, basin versus obsoletis; striulis minimis transversis ornata.

This species is named, though from an imperfect specimen, as being an interesting link between Eulimella and Chemnitzia. The apex is unfortunately hidden by a very beautiful incrustation which covers part of the spire. It has four whirls, and measures ·06 by ·027.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 2011 contains the specimen.

541. Eulimella ———, *sp. ind. (a.)*

Tablet 2012 contains an imperfect specimen of a beautifully glossy and pointed species, with a prominent sinistral apex, and subplanate whirls; of these the first six measure ·057 by ·028.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

542. Eulimella ———, *sp. ind. (b.)*

Tablet 2013 contains a specimen of normal shape, but with the surface too abraded for description. It has 6 whirls, and measures ·082 by ·038.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

543. EULIMELLA ———, *sp. ind. (c.)*

Tablet 2014 contains an extremely young shell of a large species. It has only one normal whirl; besides the sunken but tumid sinistral apex, and measures ·026 by ·02.

Hab.—Mazatlan; 1 young sp. off Spondylus; *L'pool Col.*

544. ——— ———, *sp. ind.*

Tablet 2015 contains a singular little shell, ·024 by ·015, the fry of a large species, the genus even of which cannot be determined without a series. It has a very large mammillated apex of one whirl, set slanting on the next, which by its subquadrate aperture and angulated umbilicus resembles Niso.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

GENUS ACLIS, *Lovèn.*

Ind. Moll. Scand. 1846, p. 16.—*Phil. Handb. Conch.* p. 195.—*Forbes & Hanl. Br. Moll.* vol. iii. p. 217.—*H. & A. Ad. Gen.* i. 234.

Ebala, *Gray.*—Alvania, *Searles Wood*, non *Risso.*

In this genus are deposited smooth or slightly sculptured shells; with more or less numerous whirls, tumid or loosely spiral, the apex sinistral, and the mouth round or oval, without plait.

545. ACLIS FUSIFORMIS, *n. s.*

A. t. tenui, albidâ, effusâ, elongatâ; vertice nucleoso anfr. ii. *planatis, subtumentibus, declivi; anfr. normalibus parum excurvatis, parum attingentibus, valde elongatis; striulis minimis spiralibus, interstitiis minutissime decussatis; aperturâ ovali, peritremati continuo, labro acuto.*

The species is described from four very small shells, somewhat resembling Rissoa proxima, but much more effuse. If a large fragment, which has the same sculpture, belongs to the same species, it must be a very long and slender shell when perfect. The largest of the four, with four normal whirls, measures *long.* ·065, *long. spir.* ·042, *lat.* ·022, *div.* 10°.

Hab.—Mazatlan; extremely rare, on Chama; *L'pool Col.*

Tablet 2016 contains one specimen and the fragment.

546. Aclis tumens, *n. s.*

A. t. subdiaphanâ, nitidâ, albâ, inflatâ; vertice nucleoso minuto, anfr. i. *et dimidio, decliviter sito; anfr. normalibus* vi. *valde tumentibus; aperturâ rotundatâ, peritremati continuo, acuto; labio rimulam umbilicalem monstrante.*

This species is more tumid even than A. ascaris, from which it differs in being smooth, with a minute apex. A specimen from Java sand appears exactly like in all particulars; though, with so few characters to judge by in the shell, the animal may be distinct. *Long.* ·053, *long. spir.* ·035, *lat.* ·024, *div.* 27°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*—? Java, F. Archer.

Tablet 2017 contains the specimen (slightly broken.)

Genus EULIMA, *Risso.*

547. Eulima ? hastata, *Sow.*

Conch. Ill. sp. 7, f. 10.—*Proc. Zool. Soc.* 1834, p. 7.—*Lam. An. s. Vert.*, vol. viii., p. 451, no. 2.—*H. & A. Ad. Gen.* i. 236.

Fragments were found of six specimens which may belong to this species. The vertex is stout in proportion and rounded.

Hab.—St. Elena, *Cuming.*—? Mazatlan; extremely rare, off Spondylus and Chama; *L'pool Col.*

Tablet 2018 contains 2 (broken) specimens.

548. Eulima ——, *sp. ind. (a.)*

Tablet 2019 contains an apical fragment of a species, much smaller than Eu. hastata, with the apex not so stout or rounded.

Hab.—Mazatlan; extremely rare, on Spondylus; *L'pool Col.*

549. Eulima ——, *sp. ind. (b.)*

Tablet 2020 contains fragments of a species, somewhat resembling Eu. acuta, *Sow. (Proc. Zool. Soc.* 1834, p. 8; Leiostraca a., *H. & A. Ad.*: non. Eu. acuta, *A. Ad.)* but appears a genuine Eulima. It is remarkable for the extremely slight divergence of the spire, though the whirls are not elongated.

Hab.—Mazatlan; extremely rare, on Chama and Spondylus; *L'pool Col.*

Genus LEIOSTRACA, *H. & A. Ad.*

Gen. vol. i. p. 237. Shell with a slight varix on each side of the spire. The species in this genus and in Eulima are only provisionally divided; in consequence of the small number of specimens, and paucity of specific characters.

Eulima, pars, *auct.*

Balcis, (*Leach* ms.) Gray, 1847; teste *Woodw.*

550. Leiostraca ?recta, *C. B. Ad.*

Eulima recta, *C. B. Ad. Pan. Shells*, no. 291, pp. 199, 317.—*H. & A. Ad. Gen.* i. 237.

A young shell, perfect though dead, and a fragment, answer to the description of this shell, which from the very produced base and narrow mouth, as well as the "transverse striæ marking stages of growth" appears to belong to this genus. The Cumingian type is decidedly a Leiostraca. The Mazatlan shell has 6 normal whirls, and measures *long.* ·105, *long. spir.* ·068, *lat.* ·033, *div.* 20°.

Hab.—Taboga, 5 sp. *C. B. Adams.*—Mazatlan; extremely rare, on Chama; *L'pool Col.*

Tablet 2021 contains the specimen.

551. Leiostraca ?solitaria, *C. B. Ad.*

H. & A. Ad. Gen. i. 237.

Eulima solitaria, *C. B. Ad. Pan. Shells*, no. 292, pp. 199, 318.

One nearly perfect shell and some fragments answer to the description of this species. It differs from L. iota, var. retexta, in being larger, broader, flatter, with the whirls in different proportions. *Long.* (anfr. ix.) ·123, *long. spir.* ·08, *lat.* ·046, *div.* 23°.

Hab.—Taboga; a solitary specimen in large Holothuria; *C. B. Adams.*—Mazatlan; extremely rare, on Spondylus; *L'pool Col.*

Tablet 2022 contains the specimen.

552. Leiostraca ————, *sp. ind.. (a.)*

Tablet 2023 contains a specimen intermediate between the supposed L. recta and L. solitaria. It appears to have been of

a brownish white. In a genus the species of which present so few peculiarities, it is not thought prudent to describe it. It seems to have nine whirls, and measures *long.* ·115, *long. spir.* ·075, *lat.* ·045, *div.* 23°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

553. ? LEIOSTRACA ————, *sp. ind. (b.)*

Tablet 2024 contains a short stumpy shell; with the apex decollated. It appears to have been brown, and displays a continuous peritreme. It bears some resemblance to the W. Indian L. fulvocincta, *C. B. Ad. Contr. Conch.* no. 7, p. 111. It has four whirls, and measures ·077 by ·035.

Hab—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

554. LEIOSTRACA LINEARIS, *n. s.*

L. t. minimâ, gracillimâ, albâ; axi rectâ; apice acutâ; anfr. ix., *primo decliviore; nitente, vix varicosâ; aperturâ pyriformi, continuâ; labio rimulam umbilicalem formante; columellâ haud callosâ.*

Distinguished by its minute size, and extremely slender growth. The habit is that of Leiostraca, though the varices can scarcely be traced. *Long.* ·072, *long. spir.* ·05, *lat.* ·022, *div.* 15°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 2025 contains the specimen.

555. LEIOSTRACA ? IOTA, *var.* RETEXTA.

Comp. Eulima iota, *C. B. Ad. Pan. Shells,* no. 290, pp. 198, 317.—*Sow. Thes. Conch.* in loco.—*H. & A. Ad. Gen.* i. 236.

L. ?iota, axi rectâ.

The form above indicated accords somewhat better with the Panama species than with the British, but is entirely without twist. The British specimens are also sometimes straight. The shells in this genus afford so very few distinctive characters that no species can be certainly established without an accurate knowledge of the animals. The only two specimens

found vary in proportion: the smaller, with 6 normal turns, measuring *long.* ·06, *lat.* ·028.
The larger „ ·087, „ ·033.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*
Tablet 2026 contains the larger specimen.

556. LEIOSTRACA ?DISTORTA, *var.* YOD.

Melania distorta, *Phil. Moll. Sic.* vol. i. p. 158, pl. 9, f. 10.
Eulima distorta, *Desh.* in *Lam. An. s. Vert.* vol. viii. p. 454.—*Phil. loc. cit.* vol. ii. p. 135.—*Forbes & Hanl. Brit. Moll.* vol. iii. p. 232.—*Clark, Moll. Test. Mar. Brit.* p. 451.
Leiostraca distorta, *H. & A. Ad. Gen.* i. 236.

L. t. "*L. distortæ*" *simillimâ, sed minimâ; parte suturali paululum latiore.*

The type of Leiostraca iota, *C. B. Ad.* erroneously labelled 'Jamaica' in Mus. Cuming, and very incorrectly figured by *Sow.* is somewhat broader and less bent than the Mazatlan shells: in other respects it exactly accords. After repeated comparison of very fresh specimens with the British dwarf variety of L. distorta, the characters appear exactly alike, except that the sutural portion, which (the shell being transparent) gives an appearance of a spiral line, is slightly narrower in the Scarborough specimens received from Mr. Bean. The same glossy deposit over the base, with the rather separate parietal lip, giving in some directions of light the appearance of an umbilicus, appears in each, and of the same shape. No difference can be traced in the minute vertex, nor in the varices. The colour in fresh specimens exactly accords. The specimens in Mr. M'Andrew's collection, grouped under Eu. distorta, vary extremely in size and arcuation. The Mazatlan shells are on a much smaller scale, generally more bent, and most beautifully glossy and transparent. The same form occurs in the West Indies (B. M.). According to Deshayes (*Lam. An. s. Vert.* vol. viii. p. 455, no. 8) it is found fossil in Grignon and other places. If it extends so far back in time, it is natural that the living shell should occupy a widely distributed space. As however the animals may be distinct, both in this and in L. iota, a name is added expressive of its (for the genus) extreme minuteness. The smallest sp. (of 3 normal whirls) measures ·035 by ·016. A remarkably large sp. measures *long.* ·082, *long. spir.* ·055, *lat.* ·033, *div.* 18°.

Hab.—Norway to Mediterranean, *Forbes.*—W. Indies, B. M.—(*Var.* Yod.) Mazatlan; 34 sp. living on Spondylus, dead on Chama; *L'pool Col.*

Tablet 2027 contains 4 sp. of different ages. The largest possesses its operculum, which appears like that of Chrysallida, but with the rugæ much coarser. Another is broken so as to shew the axis of the upper whirls.

Family CERITHIOPSIDÆ.

Genus CERITHIOPSIS, *Forbes & Hanl.*

Br. Moll. vol. iii. p. 364.—*H. & A. Ad. Gen.* vol. i. p. 239.—Operculum concentric, nucleus terminal.

? Non Cerithiopsis, *Andrew, Ann. Mag. Nat. Hist.* vol. x. p. 105.

Cerithium, pars, *auct.*—The position of the following species must of course remain in abeyance till the animals have been examined, or at least the opercula observed. The specimens found were not sufficiently numerous to make out the species satisfactorily.

557. Cerithiopsis tuberculoides, *n. s.*

C. t. "*C. tuberculato*" *simili, sed multo minore; tuberculis minoribus; anfr.* v. *primis lævibus, tumidis, subdiaphanis, plerumque decollatis; anfr. normalibus, lineis radiantibus usque ad carinam quartam non tuberculatam circa peripheriam continuis; basi in t. juniore angulatâ, sublævi; in t. adultâ carinulis* ii. *tumidioribus; labio tenuissimo.*

Comp. C. tuberculatum, *Mont.* in *Forbes & Hanl. Br. Moll.* vol. iii. p. 365.

Comp. Cerithium Peruvianum, *D'Orb. B. M. Cat. Moll.* p. 43, no. 375.

The shell is smaller even than dwarf specimens of the British species, and the tubercles are further apart; else the full description in the Br. Moll. would apply almost exactly to the Mazatlan shell. The smallest sp. with three normal whirls measures ·055 by ·027; the largest, with seven, *long.* ·15, *long. spir.* ·105, *lat.* ·048, *div.* 23°.

Hab.—Mazatlan; 9 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 2028 contains an exquisitely perfect young sp. with the glossy nucleus; and an adult, with the lip imperfect.

557 *b*. CERITHIOPSIS ?TUBERCULOIDES, *var.* ALBONODOSA.

C. ?tuberculoides t. rufo-fuscâ, tuberculis distantioribus, albidis; anfr nucleosis iv. *parum extantibus, subcarinatis.*

Tablet 2029 contains a young shell and portions of adults differing as above indicated. Whether they be of specific value cannot be decided till more specimens are found.

Hab.—Mazatlan? extremely rare, off Spondylus; *L'pool Col.*

558. CERITHIOPSIS CEREA, *n. s.*

C. t. "*C. tuberculoidei*" *simili, sed albido-corneâ, subdiaphanâ, gracili; anfr. primis subcarinatis, haud subito sculpturam normalem monstrantibus; anfr. tumidioribus, suturis impressis, lineis radiantibus ad peripheriam haud continuis; carinulis* iii. *ad et infra peripheriam, acutioribus, interstitiis latis, tenuissime et creberrime decussato-striatis; labro tenui, labio vix monstrante.*

Only one perfect specimen was found of this beautiful species, which differs from C. tuberculoides in its waxen colour and texture, in the more delicate sculpture, and in the pattern of the periphery and base. *Long.* ·095, *long. spir.* ·07, *lat.* ·043, *div.* 22°.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

Tablet 2030 contains the specimen.

559. CERITHIOPSIS PUPIFORMIS, *n. s.*

C. t. "*C. tuberculoidei*" *simili, sed multo minore, pupiformi, rufo-fuscâ, seu fusco-aurantiâ; anfr. nucleosis,* iv. *lævibus, haud elongatis; normalibus* iv-v., *marginibus spiræ valde excurvatis; suturis impressis; carinis valde rotundatis* iii. *in spirâ, valde tuberculatis,* iii. *ad et infra peripheriam, interstitiis minimis; labro in adultâ tenuiore, labio conspicuo.*

This little shell, in the thinness and contraction of the aperture, somewhat resembles Chrysallida. Both the complete

specimens, by the state of the mouth, indicate maturity; portions were found of a very few others. *Long.* (anfr. nucl. decol.) ·073, *long. spir.* ·05, *lat.* ·032, *div.* 30°.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 2031 contains 2 sp. one with complete mouth, the other with complete apex; also an adult labral fragment, which may belong to this species.

560. CERITHIOPSIS SOREX, *n. s.*

C. t. "*C. pupiformi*" *simili, sed multo minore, tumidiore, gibbosâ; marginibus spiræ maxime excurvatis; anfr.* vii. *quarum dimidium nucleosum est, maxime prominens, læve; anfr. normalibus subito tumentibus, planatis, suturâ vix impressâ; carinis tumentibus* iv., iii. *in spirâ maxime tuberculosis, unâ ad peripheriam subtuberculosâ, striis in basi pluribus; labro contracto, labio conspicuo; albidâ, purpureo-fuscâ fasciatâ.*

• This remarkable shell looks like a fat Shrew with a prominent snout. It is quite adult, but it probably varies in colour and compactness. *Long.* ·063, *long. spir.* ·043, *long. nucl.* ·01, *lat.* ·027, *lat. nucl.* ·007, *div.* maxime variante.

Hab.—Mazatlan; 4 sp. off Spondylus; *L'pool Col.*

Tablet 2032 contains a fresh and beautifully coloured specimen.

561. CERITHIOPSIS CONVEXA, *n. s.*

C. t. gracili, albo-fuscâ, marginibus spiræ rectis; anfr. x. *normalibus, valde convexis, suturâ profundâ, eleganter cancellatis; costis spiralibus* iv., *super costas radiantes circiter* xiii. *undulantibus, ad intersectiones subnodosis; interstitiis quadratis, intus concavis; carinâ circâ peripheriam haud tuberculosâ; basi concavâ, sublævi; aperturâ rotundatâ; labio distincto, haud prominente, rimam umbilicalem formente.*

This beautiful species is cancellated as in Phos; and is remarkable for the convexity of the whirls. The nuclear whirls are decollated. *Long.* ·18, *long. spir.* ·146, *lat.* ·056, *div.* 12°.

Hab.—Mazatlan; 1 fresh sp. off Spondylus; *L'pool Col.*

Tablet 2033 contains the specimen.

562. CERITHIOPSIS DECUSSATA, *n. s.*

C. t. conicâ, gracili, subcereâ, albidâ, ad basin rubro-fusco fasciatâ; [?anfr. primis vi. *lævibus, prominentibus;] anfr.* ix. *normalibus, carinis validis, obtusis, circa spiram* iii., *ad et infra peripheriam* iii. *acutioribus; interstitiis subquadratis, à lirulis parvis radiantibus distantibus, ad peripheriam continuis, decussatis; carinis spiralibus locis decussatis subtuberculosis; labro tenui; labio vix distincto.*

Only one adult specimen was found of this beautiful species, intermediate in sculpture between C. assimilata and C. tuberculata. The transverse liræ seem to pass under the stout keels, which are then raised into dull tubercles. The description of the nucleus is given with doubt, being supplied from a young shell, with only one normal whirl, which therefore does not affiliate with certainty to the adult. *Long.* ·16, *long. spir.* ·12, *lat.* ·045, *div.* 17°.

Hab.—Mazatlan; extremely rare, off Chama; *L'pool Col.*

Tablet 2034 contains the specimens. The lip of the adult was unfortunately broken in extracting a minute pebble.

563. CERITHIOPSIS ASSIMILATA, *C. B. Ad.*

Cerithium assimilatum, *C. B. Ad. Pan. Shells,* pp. 150, 309, no. 194.
Cerithiopsis assimilatum, *H. & A. Ad. Gen.* i. 240.
Comp. C. terebellum, *C. B. Ad.* (Jamaica) in *Sow. Thes. Conch.*
Comp. C. trilineatum, *Phil.* in *Sow. Thes. Conch.*

Another allied but very distinct species is C. cereum, *Sow.* from Australia. The Pacific shell is known by its dark reddish brown colour, nearly straight outline, very narrow sharp ribs, with the broad interstices elegantly decussated. The Mazatlan shells are shorter in proportion and of a lighter colour than Mr. Cuming's type specimens, in which respects they closely resemble C. terebellum. They differ in the sharpness of the ribs, which in that species are flattened and broader. There are five ribs, of which three appear on the spire, one at the periphery, and another (smaller) on the base, which is otherwise smooth. The first five whirls are smooth and tumid. The smallest specimen measures ·43 by ·22; the largest *long.* ·2, *long. spir.* ·145, *lat.* ·06, *div.* 20°.

Hab.—Panamá; 8 sp. under stones, sponges, marine plants, &c. near low water mark; *C. B. Adams.*—Mazatlan; 20 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 2035 contains the smallest and the largest specimens.

Family SCALARIADÆ.

Genus SCALARIA, *Lam.*

Phil. Handb. Conch. p. 178.
Scala, *(Klein,) H. & A. Ad. Gen.* vol. i. p. 220.
Clathrus, *Oken, Lehrb.* p. 257, 1815.
Cyclostoma, *Schum.* (teste *H. & A. Ad.*) non *Lam.*

564. Scalaria hexagona, *Sow.*

Proc. Zool. Soc. 1844, p. 29:—*Thes. Conch.* p. 98, no. 60, pl. 33, f. 67.—*C. B. Ad. Pan. Shells*, p. 197, no. 285.
Clathrus (Scalaria) hexagona, *H. & A. Ad. Gen.* i. 222.

Known by the six curves of continuous varices which ascend the spire in spiral lines. *Long.* ·62, *long. spir.* ·44, *lat.* ·28, *div.* 30°.

Hab.—Acapulco, *Col. Moffat.*—Panama; 1 sp. *C. B. Adams.*—Mazatlan; 2 sp.; *L'pool Col.*

Tablet 2036 contains 1 specimen.

565. Scalaria suprastriata, *n. s.*

S. t. turritâ, graciliore, compactâ; anfr. normalibus vii. *attingentibus, rotundatis; costis* xii. *acutis, vix superne productis, lineis rectis, marginem alterum spiræ parallelis, ascendentibus; anfr. primis spiraliter tenuissime striatis, adultis lævibus; umbilico nullo.*

Differs from S. mitræformis and its congeners in being broader, with the whirls not touching, and the shoulder-projections very slight. Only one nearly perfect, and two young dead specimens, probably conspecific, were found. *Long.* ·43, *long. spir.* ·27, *lat.* ·25, *div.* 40°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2037 contains the larger specimen.

566. Scalaria ———, *sp. ind. (a.)*

Tablet 2038 contains a minute shell of four whirls, measuring ·045 by ·023, and a fragment displaying sculpture. It is elongated, with very numerous (about 15) rounded varices, strongly striated spirally.

Hab.—Mazatlan; 3 sp. on Spondylus; *L'pool Col.*

567. Scalaria ———, *sp. ind. (b.)*

Tablet 2039 contains a minute shell, measuring ·06 by ·037, consisting of 6 whirls, of which 4 are smooth and nuclear. It differs from the corresponding portion of S. suprastriata in having more numerous (12 sharp) varices, with smooth interstices.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

568. Scalaria rabicostata, *n. s.*

S. t. elongatâ, gracili, anfractibus parum rotundatis; suturâ parum impressâ; costis paucis, circiter viii. *haud semper convenientibus, angustis, haud elevatis; interstitiis lævibus; umbilico nullo.*

The only specimen found, of 6 whirls, though young, seems to differ from the early state of all known West-coast species. *Long.* ·125, *long. spir.* ·085, *lat.* ·06, *div.* 33°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 2040 contains the specimen.

Subgenus CIRSOTREMA, *Morch.*

H. & A. Ad. Gen. vol. i. p. 223. Shell solid; varices irregular; whirls generally cancellated.

569. Cirsotrema funiculata, *?n. s.*

C. t. subelongatâ, graciliore, albâ; marginibus spiræ rectis; anfr. ix. *prope suturam valde impressam acute angulatis; costibus variantibus* (xv.—xx.) *haud acutis, angustioribus, ad angulam coronatis, supra basin vix continuis; anfr. ult. costis plerumque obsoletis, varicibus paucis validis; costâ rotundatâ, suturam continuante, circa basin tumente, à costis radiantibus*

nodosâ; costâ spirali alterâ labio adjiciente; totâ superficie minutissime decussatâ; labro à costis sinuato.

Comp. Scalaria diadema, *Sow.*

This shell agrees with C. diadema in almost every particular, down to the minute decussation of the surface. The remarkable pupiform growth of the Peruvian shells however, contrasted with the very regular spire (with one more whirl in proportion) of the Panama and Mazatlan specimens, is thought by Mr. Cuming sufficient to separate the species. The Mazatlan shells are not so large as those in Mr. Cuming's collection, which measure *long.* ·7, *long. spir.* ·47, *lat.* ·34, *div.* 37°.

Hab.—Mazatlan; 2 sp. only; *L'pool Col.*—Panama, 3 sp.; *T. Bridges* in Mus. Cuming.

Tablet 2041 contains one sp. with the mouth immature, sinuated by both the spiral rope-like ribs.

Family NATICIDÆ.

Genus NATICA, *Adanson.*

Natica, pars, *auct.* Operculum shelly; umbilicus twisted. Vide *H. & A. Ad. Gen.* vol. i. p. 204.

570. Natica maroccana, *Chemn.*

Nerita maroccana, *Chem. Conch. Cab.* vol. v. p. 270, pl. 188, f. 1905—1910:—ed. alt. pl. 3, f. 10—13, 25, 26:—icon. mel. in pl. 12, f. 1—5.

Natica maroccana, *Quoy & Gaim. Voy. Astr.* vol. ii. p. 236, pl. 66, f. 16—19.—*Koch* in *Zeit. f. Mal.* 1844, pp. 151–155.—*Dunk. Ind. Moll. Guin.* p. 14, no. 35.—*Mke.* in *Zeit. f. Mal.* 1847, p. 179, no. 6:—do. 1849, p. 36, no. 2:—do. 1850, p. 165, no. 17.

= Nerita marochiensis, *Gmel.* p. 3673, no. 15. — = Natica marochiensis, *Rve. Conch. Ic.* pl. 13, f. 52:—(non N. m. *Lam. An. s. Vert.* vol. viii. p. 643, no. 25: = Nerita glaucina, *Linn.* = Natica intermedia, *Phil.* olim, = N. Poliana, *Scacchi*: teste *Koch*, loc. cit.)

Var. *a.* = Natica lurida, *Phil. (Chemn.* f. 1909—10.)

Var. *b.* = Natica unifasciata, *Lam.* loc. cit. p. 640, no. 19:—*Deless. Rec. Coq.* pl. 32, f. 13:—teste *Koch*; non N. u. *auct. nonnul.**

* It is customary to name Naticæ with one band N. unifasciata. Besides however the unifasciate var. of N. maroccana, there are other very distinct species. Which was intended by *Lam.* cannot be told by the diagnosis alone.

Var. *c.*=Natica Chemnitzii, *Pfr.* in *Mart. Conch.* p. viii.*—*C. B. Ad. Pan. Shells*, p. 201, no. 295.—"N. Chemnitzii, *Mke.*" *Rve. ms.* in *Mus. Cum.*—(Non N. Chemnitzii, *Mke.* loc. cit. 1849, p. 36.—Nec *Recl. Voy. Bon.* in *B. M. Cat.* p. 22, no. 168:—=Neverita Chemnitzii, *H. & A. Ad. Gen.* i. 208.)

+Natica Pritchardi, *Forbes, Proc. Zool. Soc.* 1850, p. 272, pl. 11, f. 2 *a-c.*

? +Natica iostoma, *Mke.* in *Zeit. f. Mal.* 1847, p. 178, no. 5.

Comp. Natica tessellata, *Phil.* in *Zeit. f. Mal.* 1848, p. 158, no. 20. *(Hab. ? . . . .)*

The West-coast shells are extremely variable in size and colouring, also in the tumidity of the whirls and elevation of the spire. The Mazatlan specimens belong to a small, highly coloured variety, which, with the less coloured larger shells, was described by Prof. Forbes as N. Pritchardi. On comparing these with a series from W. Mexico, collected by Lieut. Freere, and another from the Gambia coast collected by Chief Justice Rankin, in the Bristol Museum, also with the series from various localities in the British Museum and the Cumingian Collections, it does not appear that the local types are sufficiently distinct to be accounted as separate species. The Gambia specimens go through the same variations of colour as those from W. Mexico. The Mazatlan shells much more closely resemble the ordinary Gambia type than the ordinary West Mexican type. They are however generally rather flatter in the spire, with the subsutural wrinkles rather stronger, and the operculum not indented in the inner surface.

The operculum is thin, shelly, flat or very slightly concave; with a narrow, not prominent, rounded ridge along the outer margin, and another small one bounding the part corresponding to the umbilical callosity. The whole surface is very finely, scarcely perceptibly, spirally striated: at the base rough and callous; the inner margin thickened, and very scabrous. The operculum of the Californian form is rather swollen, smooth, glossy, with the outside ridge scarcely seen; the reflex area of the callosity scarcely excavated, and the inner margin but slightly roughened. It differs from the Gulf type, much more than this does from the Gambian.

* For justification of the above synonyms, v. the elaborate article of Koch and the observations of Dunker. If the W. American shells should prove distinct, the name Chemnitzii has precedence over that of Forbes, having been described from Mexican specimens, although Menke applies the synonym to African shells.

The form appears in the Br. Mus. from Demerara, *Capt. Friend;* Philippines, *Cuming;* N. E. Australia, *Jukes;* Cape York, *Macgillivray;* Swan River; Port Natal, *Krauss;* Red Sea, *Major M'Donald.* It is quoted by Dunker from Loander and Benguela (legit *Dr. G. Tams);* and by Menke from Bathurst, St. Mary, N. W. Africa (legit *Melchers.)* In Mus. Cuming may be seen many varieties from white to dark, with or without zigzag markings and with the spire more or less elevated, all from the Society Is. As far as can be judged from the diagnosis, the Natica iostoma of Menke is also a variety of the type N. Chemnitzii.

Either the species is ubiquitous, and therefore susceptible of extreme variation; or else the characters by which local types can be distinguished from each other, have not yet been ascertained. The largest of the Mazatlan specimens only measures *long.* ·87, *long. spir.* ·22, *lat.* ·82, *div.* 100°.

An elevated sp. „ ·46, „ ·12, „ ·42, „ 90°.
A depressed sp. „ ·45, „ ·08, „ ·44, „ 110°.

Hab.—For various localities, *v.* supra.—(N. Chemnitzii, *Pfr.*) Panama; 60 sp. on soft mud near low water mark; *C. B. Adams.*—Guaymas, *Lieut. Green.*—Mazatlan; rare and small; *L'pool Col.*—(Var. unifasciata.) Guayaquil, *Hinds.*—S. W. Mexico, *P. P. C.*

Tablet 2042 contains a young shell, ·08 long, displaying the normal shape and colour, with the spire dark purplish brown. Also an operculum, ·12 long, with the callus on the spire not yet worn away; inner margin corrugately serrated, to correspond with the spiral striulæ which are more distinct than in the adult.

Tablet 2043 contains * sp. very young.—2044, 4 sp. various ages.—2045, 1 sp. with its operculum, and 2 separate opercula.—2046, 4 sp. richly coloured, olive.—2047, 3 do. pattern clouded at the end.—2048, 4 do. light shade.—2049, 3 do. slate colour.—2050, 2 sp. shewing diversity of form.

571. NATICA ————, *sp. ind.*

Tablet 2051 contains a minute shell, * long, resembling N. maroccana, but of a light buff colour, nucleus smaller, upper whirls flattened, and sutural region not grooved.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

* The numbers will be added in the Appendix.

Genus LUNATIA, *Gray.*

Proc. Zool. Soc. 1847, p. 149, no. 133.—*H. & A. Ad. Gen.* vol. i. p. 206. Operculum horny; umbilicus straight.

572. Lunatia tenuilirata, *n. s.*

L. t. tenui, cinereâ, purpureo tinctâ seu nebulosâ, tumente; anfr. v. rotundatis, totâ superficie tenue spiraliter lirulatâ; suturâ impressâ, apice haud planato; aperturâ ovali, labio tenui; umbilico aperto, ad basin angulato.

One perfect young and one broken older shell were all that were found of this curious little species, remarkable for its thinness and spiral sculpture. The larger specimen is ·055 long. The smaller one measures *long.* ·036, *long. spir.* ·01. *lat.* ·037, *div.* 110°.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 2052 contains the perfect specimen.

573. Lunatia ———, *sp. ind. (a.)*

Tablet 2053 contains an extremely small specimen, ·034 across, globose, with a slight sutural groove, and a very small slight umbilicus.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

574. Lunatia ———, *sp. ind. (b.)*

Tablet 2054 contains a perfect young and a broken older shell of a white, glossy, globose species, with large straight umbilicus. The largest is only ·054 across.

Hab.—Mazatlan; 5 sp. in shell washings; *L'pool Col.*

575. Lunatia ———, *sp. ind. (c.)*

Tablet 2055 contains an imperfect specimen; glossy, white, tinged with brown especially about the apex, which is flattened; with very fine striæ of growth; and an extremely small umbilicus, slightly waved by a very small callosity. *Lat.* ...

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Genus POLINICES, *Montf.*

Gray in *Proc. Zool. Soc.* 1847, p. 149, no. 185.
Mammillaria, *Swains, Treatise* &c. p. 345, 1840.
Mamma, *(Klein) H. & A. Ad. Gen.* vol. i. p. 210.
Natica, pars, *auct.* Shell white, or slightly coloured, with a strong parietal callosity. Operculum horny. The species of this group are not yet satisfactorily ascertained; and being variable, yet with few distinctive characters, are very difficult to define.

576. Polinices uber, *Val.*

Natica uber, *Val. Rec. Obs. Humb.* 1833, vol. ii. p. 266.—*B. M. Cat. D'Orb. Moll.* p. 33, no. 297.—*Phil.* in *Kust. Mart.* p. 60, sp. 65, pl. 10, f. 1.—*Rve. Conch. Ic.* pl. 13, sp. 54.
? Var.=Natica alabaster, *Rve. Conch. Ic.* pl. 9. f. 33, *a*, *b*.
Comp. Natica ovum, *Mke.* in *Zeit. f. Mal.* 1850, p. 165, no. 18.
Comp. Natica rapulum, *Rve. Conch. Ic.* pl. 12, f. 47, *a*, *b*.
Mamma uberina, *H. & A. Ad. Gen.* i. 211.

The extreme forms of this species are so dissimilar, as to have warranted their separation. An examination of some hundreds of specimens however shews that there is no consistency in the types. The shell is either thin or heavy; subglobular or very transverse; with the umbilicus quite open, or reduced by the callosity to a mere chink; the callus varying greatly in shape and intensity. The callosity projects considerably beyond the aperture, leaving a sutural groove. Umbilicus more or less slightly spiral. The extreme open form appears to be the N. alabaster, *Rve.* Menke's shell is described as pellucid, with an opaque zone at the suture; but may be a thin representation of this species. The N. unimaculata, *Rve.* agrees almost exactly in form, but has a dark spot on the callosity. The Mazatlan shells are pure white; with an extremely thin deciduous epidermis (of which traces only were seen); and presenting the same habit of growth in the smallest specimen, which is ·36 long. The largest sp. (form alabaster) measures *long.* 1·46, *long. spir.* ·38, *lat.* 1·4, *div.* 110°.
An elevated sp. „ ·95, „ ·28, „ ·82, „ 90°.

Hab.—Casma, Peru; in muddy sand, 4 fm.; *Cuming.*—Callao, *D'Orbigny.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 2056 contains 4 sp. spreading form, open umbilicus. (The largest is N. alabaster, *Rve.*)—2057, 4 do. umbilicus more

or less closed. The largest (which is very thin) is probably N. ovum, *Mke.*—2058, 6 sp. normal form, open umbilicus.—2059, 4 do. umbilicus more or less closed.—2060, 4 sp. acuminated form, umbilicus open.—2061, 5 do, umbilicus more or less closed.—One sp. has a second umbilical groove.

Family LAMELLARIADÆ.

Genus LAMELLARIA, *Mont.*

Lamellaria, *Mont. Linn. Trans.* 1825, vol. xi. p. 184 (pars).—*H. & A. Ad. Gen.* vol. i. p. 201.
Marsenia, *Leach.—Phil. Handb. Conch.* p. 163.

577. Lamellaria ———, *sp. ind. (a.)*

Tablet 2062 contains a minute white shell, measuring ·065 by ·047, having one whirl and a half, with coarse striæ of growth, and reflected labium.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

578. ? Lamellaria ———, *sp. ind. (b.)*

Tablet 2063 contains a fragment which may belong to Lamellaria or even to an Atlantid. It possesses a stout globular nucleus of two rounded whirls, white and glossy, large (as compared with Vitrinella) and rapidly increasing; with a portion of a flat expanding outer whirl, the texture of which may have been, when fresh, somewhat gelatinous, and in its dried state is transparent and very finely wrinkled.

Hab.—Mazatlan; 1 broken specimen off Spondylus; *L'pool Col.*

Family FICULIDÆ.

Genus FICULA, *Swains.*

Sycotypus, *(Browne,) H. & A. Ad. Gen.* vol. i. p. 198.
Pyrula, pars, *Lam.*

[579. Ficula ventricosa, *Sow.*

Pyrula ventricosa, *Sow. Tank. Cat.* no. 1614, App. p. 16, 1825.—*Kien. Icon. Conch.* p. 27, pl. 12, f. 2.—*Lam. An. s. Vert.*

vol. ix. p. 521, no. 29.—*Mke.* in *Zeit. f. Mal.* 1847, p. 182, no. 22:—*do.* 1851, p. 18, no. 83.—*C. B. Ad. Pan. Shells*, p. 128, no. 146.

Ficula ventricosa, *Chen. Ill. Conch.* pl. 1, f. 1, pl. 2, f. 1.
Bulla decussata, *Wood, Ind. Test. Suppl.* pl. 3, f. 3.
Ficula decussata, *Rve. Conch. Ic.* pl. 1, f. 3.

The existence of this remarkable shell in the Mazatlan fauna, is not yet satisfactorily ascertained. It was entirely absent from the L'pool Col.; but Mr. Hanley states that a very few specimens were sold at the auctions with the Havre Col. It occurs in Menke's list; but the shells collected by Melchers were mixed with bought specimens. In Dr. Gould's collections, a specimen occurs, marked doubtfully from Mazatlan by Lieut. Green. It appears to be rare every where.

Hab.—Panama; 8 dead sp.; *C. B. Adams.*—Taboga, *Col. Jewett.*—S. W. Mexico, 1 sp. *P. P. C.*—San Blas, *Kiener.*—? Mazatlan, *Lieut. Green*:—do. extremely rare; *? Havre Col.*]

Family TRITONIDÆ.

Teeth in seven series, as in Natica.

Genus TRITON, *Lam.*

Lam. An. s. Vert. Ed. I. vol. vii. p. 176.

Tritonium, *Cuv.* 1817.—*Phil. Handb. Conch.* p. 143.—*H. & A. Ad. Gen.* vol. i. p. 101.

The familiar Lamarckian name is retained, because Tritonium is often employed in a different sense, as by Middendorff for Chrysodomus, &c., and also because it too nearly resembles Tritonia, a genus of Nudibranchs.

Subgenus ARGOBUCCINUM, *Klein.*

Argobuccinum + Lagena, *H. & A. Ad. Gen.* vol. i. p. 104.
Cassidaria, pars, *Hinds.*

580. Argobuccinum nodosum, *Chemn.*

Argo-buccinum nodosum, *Chemn. Conch. Cab.* vol. iv. p. 98, pl. 131, f. 1255-6, (1780.)

Triton nodosum, *Mke.* in *Zeit. f. Mal.* 1850, p. 189, no. 78.
Murex argus var. *b.* pars, *Gmel.* 3547, no. 78.
Triton Chemnitzii, *Gray* in *Zool. Beech. Voy.* p. 110, (1839.)—*Rve. Conch. Ic.* pl. 11, f. 37.—*C. B. Ad, Pan. Shells,* p. 115, no. 126.
Fusus Wiegmanni, *Anton, Verz.* p. 77, (1839.)—*Phil. Abbild.* pl. 2, f. 2, 4 var.
Lagena Wiegmanni, *H. & A. Ad. Gen.* i. 104.
Cassidaria setosa, *Hinds,* Pubi.
Triton perforatus, *Conr. Proc. Ac. N. S. Phil.* vol. iv. p. 156 (Feb. 1849):—*Journ. A. N. S. Ph.,* n. ser., vol. i. p. 280, pl. 39, f. 6 var.

Shell ventricose; very thin or rather solid; spire more or less elevated; shoulder either round, or (usually) with a more or less developed rounded keel; canal varying in length and twist, shewing more or less of an umbilical chink; colour tawny, sometimes with the spiral ribs purplish brown. Mouth and spire often seen without varix; penultimate varix either absent, or at variable distances from the last, which is not prominent, sharply serrated by the projections of the internal teeth which are generally grouped in pairs. Labium nearly smooth, or with more or less prominent white corrugated teeth on a purplish brown ground. Nuclear whirls smooth, turrited, deciduous, fixed slanting on the rest, which are at first cancellated, afterwards only with spiral costæ, sometimes obsolete. The epidermis is extremely thin and deciduous, crossed by more or less frequent scaly rows, ending in bristly hairs. The opercula were unfortunately not sent. The shells are free from incrustations. The largest of the specimens measures *long.* 4·66, *long. spir.* 1·66, *lat.* 3·04, *div.* 70°.

A small rounded sp.	„ 3·12,	„ 1·2,	„ 2·18, „ 80°.
A broad sp.	„ 3·55,	„ 1·2,	„ 2·66, „ 80°.

Tablet 2064 contains 1 sp. rounded whirls.—2065, 3 sp. normal state.—2066, 3 do, colour developed.—2067, 2 do. keel developed.—2068, 5 sp. shewing variation in varices; the ultimate and penultimate being distant 100°, 140°, 210°, 250°, and 300° respectively.—2069, 2 sp. one with penultimate varix swollen but not marked off; the other do. foliated.—2070, 2 sp. one with spiral costæ broad and distant; the other do. nearly obsolete.—2071, 1 sp. mended after fracture.—2072, 1 sp. after hot acid process, varix forming.

Family TURBINELLIDÆ.

Genus TURBINELLA, *Lam.*

Journ. Hist. Nat. 1799, pars :—*Phil. Handb. Conch.* p. 140 :—(non Turbinellus, *Oken.*)
Cynodonta, *Schum.* :—*Gray Fig, Moll.* p. 68, no. 14.
Vasum, *(Bolten,) H. & A. Ad. Gen.* i. 155.

581. Turbinella cæstus, *Brod.*

Proc. Zool. Soc. 1833, p. 8.—*Müll. Syn. Nov. Test. Viv.* p. 156.—*Rve. Conch. Ic.* pl. 6, f. 34.—*C. B. Ad. Pan. Snells*, p. 130, no. 149.—*Mke.* in *Zeit. f. Mal.* 1851, p. 17, no. 81.
Vasum cæstus, *H. & A. Ad. Gen.* i. 156.
=Turbinella ardeola, *Val. Rec. Obs.* vol. ii. p. 283. (1833.)

Shell known from the very similar W. Indian T. muricata by the want of the intercalary plait between the large ones, which are 4, sharp in the young shell, sometimes flattened in the adult. Shell ponderous, covered with a very thick olive epidermis in layers of growth. Spire generally eroded. Umbilicus sometimes distinct, sometimes only a chink. Mouth marble white. Operculum very small for the shell, thick, horny, nearly smooth; unguiculate, much twisted, muscular scar corrugated from the terminal nucleus. It was rare in the L'pool Col., more common in the Havre Coll., a large number of specimens having been seen in a London shop with the beautiful epidermis carefully cleaned off. A finely grown specimen measures *long.* 4·6, *long. spir.* 1·4, *lat.* 3·2, *div.* 90°. The largest (with the spire decorticated) measures 5·2 by 3·6, and weighs 14 oz.

Hab.—Bay of Caraccas; in soft mud among rocks; *Cuming.*—Taboga; on sand beach, near low water mark, very rare; *C. B. Adams.*—Mazatlan; not common; *L'pool & Havre Coll.*

Tablet 2073 contains a young, finely grown sp., spire prominent.—2074, the most perfect sp. with operculum.—2075, the largest sp. with operculum.—2076, 1 sp. deformed growth, upper teeth much flattened.—2077, 1 sp. the entire spire abraded; mouth reddish green.—2078, 1 sp. curiously deformed, plaits obliterated except one dull callus.

Family FASCIOLARIADÆ.

Genus LATHIRUS, *Montf.*

Conch. Syst. vol. ii. p. 531. This genus includes the turrited species, usually ranked with Turbinella, and intermediate between that genus and Fasciolaria.
Latirus, *H. & A. Ad. Gen.* vol. i. p. 152.

582. Lathirus ceratus, *Gray.*

Murex ceratus, *Gray*, in *Wood, Ind. Test. Suppl.* pl. 5, f. 15.
Turbinella cerata, *Gray* in *Griff. An. King. Moll.* pl. 41, f. 5:—*Zool. Beech. Voy.* p. 114.—*Kien. Icon. Conch.* p. 25, no. 16, pl. 16, f. 1.—*Rve. Conch. Ic.* pl. 7, sp. 37.
Latirus ceratus, *H. & A. Ad. Gen.* i. 152.

This shell is rightly described by Kiener as having 3 plaits, but is figured by him with four, and by Reeve (number not stated) with five. The young shell is rather more turrited than L. tuberculatus, *Brod. (Proc. Zool. Soc.* 1833, p. 7: *Kien.* no. 17, pl. 16, f. 2:—*Rve.* pl. 8, sp. 12) also brought from Mazatlan by the same traveler; and its colour is uniform: else the two species are closely allied, although Messrs. Adams place the latter in another genus, (Peristernia tuberculata, i. 154.) The young shell is more distinctly grooved within than the adult; with a parietal tooth near the suture, and a labial tooth which may have been mistaken for a plait. The adult measures *long.* 3″, *long. spir.* 1·55, *lat.* 1·53, *div.* 45°.

Hab.—Mazatlan, *Dupetit-Thouars.*—Galapagos; under stones at low water; *Cuming.*—Taboga and Panama; do. and in crevices of rocks, 12 sp.; *C. B. Adams.*—Mazatlan: extremely rare; *L'pool Col.*

Tablet 2079 contains the largest specimen.

Genus LEUCOZONIA, *Gray.*

Proc. Zool. Soc. 1847, p. 136.—*H. & A. Ad. Gen.* vol. i. p. 154.
Turbinella and Monoceros, pars, *auct.*

583. Leucozonia cingulata, *Lam.*

Monoceros cingulatum, *Lam. An. s. Vert.* vol. x. p. 118, no. 1:—*Enc. Méth.* pl. 396, f. 4.—*Sow. Gen.* f. 4:—*Conch. Ill. Cat.* no. 1.—*Rve. Conch. Syst.* pl. 261, f. 4:—*Conch. Ic.* pl. 3,

f. 11.—*Schub. & Wagn.* in *Chemn. Suppl.* p. 150, pl. 233, f. 4096.—*C. B. Ad. Pan. Shells*, no. 68, p. 75.
Monoceros cingulatus, *Mke.* in *Zeit. f. Mal.* 1850, p. 180, no. 46.
Buccinum cingulatum, *Wood, Ind. Test.* pl. 24, f. 167.
Turbinella cingulata, *Kien. Icon. Conch.* p. 36, pl. 20, f. 1.—*Less. Rev. Zool.* Jul. 1842.—*Kust. Conch. Cab.* p. 31, pl. 7, f. 8.

This remarkable shell is distinguished at once from Monoceros by its plaited columella as in Lathirus, and its very strong, twisted, unguiform operculum which can scarcely be distinguished from that of Turbinella cæstus. The labrum has a broad shallow posterior sinus, and two deep narrow ones on each side of the stoutly projecting horn (sometimes ·65 long). It is internally faintly lirate, much advanced in the middle (to the level of the horn), serrated at the edge, where it is tessellated by the extremities of the darker bands. The shell, substantially white with broad and fine dark bands, is covered with a smooth, adherent, brown epidermis; and is almost always encrusted with coralline, Vermetidæ, &c. Labium thick, corrugated near the plaits, with an infrasutural lengthened tooth, forming a slight sutural canal. Spire rather elevated, or depressed. Shoulder somewhat rounded, or sharply keeled. The largest sp. measures *long.* 2·38, *l. sp.* ·94, *lat.* 1·78, *div.* 80°.
An elevated sp. „ 1·8, „ ·88, „ 1·24, „ 70°.
A depressed sp. „ 1·72, „ ·54, „ 1·3, „ 90°.

Hab.—W. Mexico, *Humboldt & Bonpland*, teste *Lam.* non *Vab.*—Panama; in clefts of rocks at low water; *Cuming.*—Do. and Taboga, not uncommon; *C. B. Adams.*—Mazatlan; extremely abundant; *L'pool & Havre Coll.*

Tablet 2080 contains 3 sp. shoulder somewhat rounded, elevated.—2081, 4 do. normal, (one with operculum.)—2082, 3 do. depressed.—2083, 3 sp. shoulder sharply angulated, elevated.—2084, 3 do. normal.—2085, 3 do. depressed.—2086, 2 sp. lip mended after fracture.—2087, 2 sp. horn in process of renewal.

Genus FASCIOLARIA, *Lam.*

584. Fasciolaria princeps, *Sow.*

Sow. Tank. Cat. App. p. 16.—*Kien. Conch. Ic.* p. 6, no. 4, pl. 12, 13.—*Rve. Conch. Syst.* vol. ii. p. 184, pl. 231.—*Lam. An. s. Vert.* vol. ix. p. 436, no. 10.—*Mke.* in *Zeit. f. Mal.* 1851, p. 17, no. 82.

Fasciolaria aurantiaca, *Sow. Gen.* no. 30: non *Lam. loc. cit.* p. 434, no. 4.

Mr. Sowerby, having discarded his own original name, adopted another which had been preoccupied by Lamarck. The dealer unfortunately cleaned the whole stock of this magnificent species, disregarding both epidermis and opercula. Shell of a rich orange, under a rather thick reddish brown epidermis, striated in lines of growth; with numerous rounded spiral ridges, having broad interstices, most developed near the centre of the whirls. In the middle is generally seen a row of stout tubercles, sometimes almost wholly evanescent. Labrum inside with finely raised reddish spiral striæ. Columellar plaits two, not conspicuous. Operculum pyriform, apex terminal: outside with about 5 longitudinal furrows on the middle and interior; exterior with irregular diagonal ribs; inside with very large attachment, not corrugated.* *Long.* 11·5, *long. spir.* 5·7, *lat.* 5·4, *div.* 40°.

Hab.—Peru, *Cuming.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 2088 contains a solitary specimen with epidermis that escaped the acid bowl.—2089, a strongly tuberculated specimen.—2090, the largest, scarcely tuberculated specimen; and an operculum.

Sub-Family MITRINÆ.

These creatures, so numerous in form and varied in painting in the E. Indian Islands, are said not to be partial to a continental life. Very few species are found on the W. coast of America, and only two, of very sombre aspect, occur in the Mazatlan collection.

Genus MITRA, *Lam.*

Mitra, *Lam. Journ. Hist. Nat.* 1799, (pars.)—*H. & A. Ad. Gen.* vol. i. p. 168.
Thiarella, *Swains.*

585. Mitra lens, *Mawe.*

Voluta lens, *Wood Ind. Test. Suppl.* 1828, pl. 3, f. 25. (f. 28, sec. *Mke.*).

* A few of these opercula having dropped into the Pyrula box, while all the shells were taken away to the acid, I unfortunately distributed them as the opercula of the latter. Authentic specimens of each species in Capt. Kellett's collections, verified the correction of the mistake.

Mitra lens, *Rve. Conch. Ic.* pl. 1, f. 1.—*Mke.* in *Zeit. f. Mal.* 1851, p. 35, no. 120.—*C. B. Ad. Pan. Shells*, p. 42, no. 17.—*H. & A. Ad. Gen.* i. 169.

Tiara foraminata, *Swains.* ms.; *Brod. Proc. Zool. Soc.* 1835, p. 194.

Mitra Dupontii, *Kien. Icon. Conch*, p. 43, pl. 13, f. 39.

This species varies very much in growth and sculpture; but is almost always recognized by the deep punctures which occur at irregular distances in the middle of the whirl, causing tubercles to rise up within. Between these are numerous broad costæ, 8—13 in a whirl, more or less obsolete in the adult. These are crossed in the young shell, by numerous fine, more or less sharp spiral ridges; which at varying periods of growth become rounded, and finally obsolete. At the same time impressed spiral lines often appear, connecting the pits. When adult, the columella has 3 plaits, with a fourth underneath, rudimentary. In the young shell this is absent; and the third is often rudimentary, rarely absent. The shell is covered with a smooth, close, dark olive or brownish epidermis; and is generally densely incrusted with coralline. Underneath it is of an ashy brown, sometimes light, sometimes very dark. The largest sp. measures *long.* 2·4, *long. spir.* 1·34, *lat.* ·94, *div.* 30°.

A broad sp.	„	„	1·35,	„	·65,	„ ·6, „ 50°.
A narrow sp.	„	„	1·48,	„	·8,	„ ·54, „ 30°.

Hab.—Panama, St. Elena, and Is. Plata; in sandy mud, 6—14 fm.; *Cuming.*—Panama, very rare, *C. B. Adams.*—La Paz, *Major Rich.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 2091 contains 4 sp. elongated form.—2092, 5 sp. normal state.—2093, 4 sp. broad.—2094, 7 sp. shewing changes of sculpture.—2095, 2 sp. after acid process, shewing colour.—2096, 1 sp. curiously eroded.—2097, 1 sp. with egg-cases.

Tablet 2098 contains a young specimen, strongly and closely sculptured, but without pits. Deeply cut lines however appear, in which the pits would probably have afterwards appeared.

Tablet 2099 contains a small acuminated sp. without pits, costæ narrow and distant, spiral sculpture nearly obsolete, columella biplicate. Were it not for the great variation in the ordinary specimens, this would have been regarded as a distinct species.

Genus STRIGATELLA, *Swains.*

Treatise, &c. 1840.
Mitra, pars, *auct.* Shell Collumbelloid.

586. Strigatella tristis, *Brod.*

Mitra tristis, *Brod. Proc. Zool. Soc.* 1835, p. 194.—*Rve. Conch. Ic.* pl. 15, f. 114.—*C. B. Ad. Pan. Shells*, p. 44, no. 20.
Strigatella tristis, *H. & A. Ad. Gen.* i. 174.
=Mitra amphorella, *P. P. C. Cat. Prov.* non *Lam.*

There are 4 distinct columellar plaits, with one rudimentary in the adult. In very young shells, only three are seen. There is no sculpture except some faint spiral lines, and very irregular swellings of growth. The shoulder is more or less swollen, with a light band more or less developed. The largest specimen measures *long.* 1·2, *long. spir.* ·47, *lat.* ·58, *div.* 50°.
An acuminate sp. „ ·9, „ ·4, „ ·35, „ 40°.
A broad sp. „ ·95, „ ·34, „ ·45, „ 60°.

Hab.—St. Elena and Galapagos ; in sandy mud, 6—10 fm. ; *Cuming.*—Panama ; very rare, under stones near low water mark ; *C. B. Adams.*—Mazatlan ; not uncommon, generally incrusted ; *L'pool Col.*

Tablet 2100 contains 3 sp. very acuminate.—2101, 4 do. spire elevated.—2102, 5 do. normal state.—2103, 4 do. broad form.—2104, 2 sp. after acid, shewing colour.—2105, 2 sp. much encrusted with coralline and Bryozoa.—2106, 3 sp. mended after fracture.

Family MARGINELLIDÆ.

587. Marginella minor, *C. B. Ad.*

Pan. Shells, pp. 40, 304, no. 40.
Gibberula (Persicula) minor, *H. & A. Ad. Gen.* i. 193.

This species is stated by Prof. Adams to be the analogue of the W. Indian M. Lavallcana, *D'Orb. B. M. Cat. Cub. Moll.* p. 25, no. 282, (=M. minima, *Guild.*) from which it differs in being narrower at the shoulder. About 200 specimens were found on shells, but mostly young or imperfect. It is extremely glossy, never horn-coloured when fresh, white, nearly transparent, in shape somewhat like M. sapotilla ; with two pro-

minent and two less prominent folds, and sometimes a fifth slightly developed. Labrum smooth. The spire, which is slightly elevated, has its whirls concealed by the parietal callus, but there are either 4 or 5 in the adult. The youngest sp. measures ·025, by ·016; the largest adult, *long.* ·085, *long. spir.* ·015, *lat.* ·054, *div.* 120°.

Hab.—Panama, 10 sp. *C. B. Adams.*—Mazatlan; not uncommon on Chama, Spondylus, and Modiola capax; *L'pool Col.*

Tablet 2107 contains 7 young, and 3 adult sp., varying in outline.

588. MARGINELLA POLITA, *n. s.*

M. t. "M. minore" simili; sed minore, regulariter ovatâ, antice vix productâ, spirâ rotundatâ, haud extante; callo parietali minore: plicis iv. *subæqualibus, conspicuis.*

This species is regularly elliptical, with the foci near. The specimens found may not be mature, though they appear normally formed. They do not accord with the young of the last species, which, though it varies somewhat, gives no signs of assuming the form of this. The shell is extremely glossy. *Long.* ·034, *long. spir.* ·002, *lat.* ·022, *div.* 150°.

Hab.—Mazatlan; 6 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 2108 contains the smallest and largest sp. and one somewhat aberrant.

589. MARGINELLA MARGARITULA, *n. s.*

M. t. parvâ, albâ, politâ; interdum striulis incrementi haud conspicuis; ovatâ, antice et postice haud angustâ; spirâ, t. juniore et adultâ, omnino celatâ; aperturâ elongatâ, angustâ, spiræ superante; labro t. juniore acuto, adultâ ut in Cypræâ incurvato, dentato; postice canaliculato, callositate parietali munito; plicis iv. *distinctis, posticis in adultâ undatis, basalibus majoribus; interdum denticulis parietalibus minimis; labio parietali nullo.*

Comp. Marginella ovuliformis, *D'Orb. B. M. Cat. Cub. Moll.* p. 24, no. 281.

This little species partakes of the characters of Persicula, and is extremely like the W. Indian P. clandestina: from which it differs (if rightly placed by Messrs. Adams among

the Gibberulæ, *Gen.* i. 193,) in the absence of parietal lip. A slight twist in the upper plaits in some positions gives the appearance of an additional fold. The posterior canal and callosity are seen in the young shell as well as the adult. The smallest sp. measures ·032 by ·021; the largest, *long.* ·073, *lat.* ·047.

Hab.—Mazatlan; rare, off Chama and Spondylus; *L'pool Col.*

Tablet 2109 contains 5 sp. young and 2 adult, varying somewhat in the amount of prominence above the spire.

Family OLIVIDÆ.

There are so few specific marks in the shells of this family, and the painting (which is most relied on) is so variable, that the species intended by different authors cannot always be recognized. Until large series have been collated from various localities, and their animals have been examined, allied forms can only be provisionally registered. One species, O. porphyria, stands alone in its distinctness. It was found in the S. W. Mexican collection, and also in a box of shells from the same province abounding in Terebra variegata, a very large rough Pecten, and other shells not found at Mazatlan. It is indeed quoted by Menke, *Zeit. f. Mal.* 1851, p. 23, no. 100,) but as his list includes bought shells, it is not of undisputed authority; and the entire absence of so large and attractive a species from so vast a collection as that here described is negative evidence of no little weight. At the same time it is probable that some Olivæ are migratory creatures; and this may have been absent during the period that the industrious Professor Reigen was ransacking the ocean bed.

Genus OLIVA, *Brug.*

Encycl. Meth. p. 15, no. 38, 1792, (pars).
Dactylus *(Klein) H. & A. Ad. Gen.* vol. i. p. 142.

590. Oliva angulata, *Lam.*

Ann. Mus. vol. xvi. 1810, p. 310, no. 6;—*An. s. Vert.* vol. x. p. 607, no. 6.—*Enc. Méth.* pl. 363, f. 6.—*Ducl. Mon. Oliv.* pl. 17, f. 9, 10;—*do.* in *Chénu*, pl. 18, f. 9, 10.—*Kust. Conch. Cab.* pl. 2, f. 1, 2.—*Rve. Elem. Conch.* pl. 1, f. 4, pl. D, ;—

Conch. Ic. pl. 1, f. 1.—*Mke.* in *Zeit. f. Mal.* 1851, p. 23, no. 101.—*C. B. Ad. Pan. Shells*, p. 48, no. 32.
Voluta incrassata, *Dillw. Descr. Cat.* p. 516, no. 35, 1817.—*Wood Ind. Test.* pl. 19, f. 35.
Strephona (Dactylus) incrassatus, *H. & A. Ad. Gen.* i. 143.

The few specimens sent of this fine species were soon secured by collectors. They vary in amount of angulation and elevation of spire, and in the pattern of the very characteristic dark blotches. A broad specimen, shoulder flattened and angle developed, measures *long.* 2·3, *long. spir.* ·22, *lat.* 1·18, *div.* 110°. A slender sp. scarcely angulated, *long.* 2·45, *long. spir.* ·3, *lat.* 1·19, *div.* 100°.

Hab.—Peru, Deshayes.—Panama, very rare, *C. B. Adams.*—Gulf Nicoya; in sandy mud, 9 fm.; *Cuming.*—Bay of Magdalena, Duclos: 24·5° N. [?]—Mazatlan; extremely rare: *L'pool & Havre Coll.*

Tablet 2110 contains the broad sp.

591. Oliva Melchersi, *Mke.*

Zeit. f. Mal. 1851, p. 24, no. 104.
Oliva angulata, jun. *P. P. C. Cat. Prov.*
Comp. Oliva subangulata, *Phil. Abbild.*
Comp. O. Cumingii, *Rve. Conch. Ic.* pl. 11, sp. 19, (Gulf of California, *Capt. Donnel.)*
Comp. O. polpaster, *Ducl. Guér. Mag. Zool.* 1839, pl. 20:—*Rve. Conch. Ic.* pl. 14, f. 29: *var.* (Bay of Montija, sandy mud, 13 fm. *Cuming.*—Panama, Duclos.)

The Mazatlan shells of the reticularis type divide themselves with tolerable facility into two sets, of which one answers in the main to the description of Menke (too minute however to include the whole group), and the other appears to be the O. venulata of Menke and Prof. Adams. In another collection were found several distinct varieties of the latter. The discrimination of these from each other and from O. reticularis is a matter of extreme difficulty; which Mr. Reeve escapes by uniting them all together. As the Pacific and Atlantic shells however have a different habit, it seemed right for the present, in so difficult a genus, to keep them apart.

The shells here grouped are intermediate in character between O. angulata and O. venulata. They are smaller than the former, larger than the latter; with an acute spire, and an

angle below the shoulder less conspicuous than in O. angulata. The parietal teeth are either wanting or extremely minute; and the columellar plaits are generally white; rarely slightly tinted with purple or brown. The prevailing tint is as in the W. Indian O. reticularis, which is a much more regularly shaped shell. There are always a number of penciled lines below the suture, sometimes irregular, sometimes gathered in bundles or triangles. The colour-pattern shews a tendency to triangulation, sometimes nearly hidden by a rich layer of dark cloudy dots, (passing into O. angulata,) sometimes sharply developed. The variations in painting are so great as to require that a large proportion of the small stock sent should be retained. *Long.* 1·82, *long. spir.* ·42, *lat.* ·82, *div.* 80°.

Hab.—Mazatlan; very rare; *L'pool Col.*

Tablet 2111 contains 2 sp., with rich, lustrous brown markings; triangulation indistinct.—2112, 2 do. ground lighter.—2113, 2 do. ground yellowish.—2114, 2 do. ground grey.—2115, 2 do. light, with faint markings.

Tablet 2116 contains 2 sp., rich dark colour, triangulation distinct.—2117, 2 do. ground lighter.—2118, 2 do. ground orange brown.—2119, 2 do. markings flesh coloured.—2120, 2 do. zigzag lines separating.

592. OLIVA INTERTINCTA, *?n. s.*

O. t. formâ "O. Melchersi" simulante: sed multo minore; anfr. iii. *nucleosis porcellanis, apice planato;* iv. *normalibus, spirâ subelevatâ; inter trientem et dimidium totius longitudinis obscure angulato; spirâ parum callosâ; superficie albâ, castaneo sparsim tenue maculatâ, interdum lineis irregularibus confluentibus; labro intus ad marginem castaneo-fusco variegatâ; pariete denticulatâ; plicis columellaribus omnibus castaneis.*

More than a score of specimens were found agreeing in the above particulars, and not according with the young of any of the other species; of which however it may ultimately prove to be a variety. It has the shape of O. Melchersi, but differs in the dentition of the inner lip, and in the chestnut stain on all the plaits, not on all but one as in O. venulata. Miss Steere, whose attention to this genus is well known, has a larger specimen, which she had long considered as distinct: another, from an unknown locality, in my collection, confirms her judgment. *Long.* ·78, *long. spir.* ·2, *lat.* ·37, *div.* 70°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2121 contains 3 sp. shewing the extremes of variation.

593 OLIVA ?VENULATA, *Lam.*

An. s. Vert. vol. x. p. 611, no. 13.—*Mke.* in *Zeit. f. Mal.* 1851, p. 23, no. 103.—*C. B. Ad. Pan. Shells*, p. 56, no. 40.

? = Oliva venulata, *Ducl. Mon. Oliv.* pl. 16, f. 5, 6.

+ Oliva araneosa, *C. B. Ad. Pan. Shells*, p. 49, no. 33; (?non *Lam.)*

? + O. Julieta, *Mke.* in *Zeit. f. Mal.* 1851, p. 23, no. 102.—*P. P. C. Cat. Prov.*: (non *Ducl.)*

= Oliva reticularis, *var.*, *Rve. Conch. Ic.* pl. 10, f. 16 *b*, *d*, *g*.

The true O. Julieta was not found in this collection. Whether Menke's shell was the true one imported, or whether he made the same mistake that I had copied, cannot be certainly told. His description suits best with the dark variety of this species. The O. venulata and O. araneosa of Prof. Adams, are separated, from single specimens of each, "principally by the short, dark brown, bent lines of the former." This character is variable. Whether the O. venulata of *Ducl.* is that of *Lam.* and whether either or both of them represent this, the Pacific analogue of O. reticularis, is also a matter of doubt.

Shell going through the same changes of pattern as O. Melchersi, but ordinarily much smaller; 1·2 in. being the usual size of large specimens. The prevailing tint is a yellowish olive, with purple brown markings; rarely of a general greenish yellow, very rarely dark brown. The triangulation is less common and distinct in this species; and the dark lines often run into spots resembling O. Julieta. The shape is intermediate between O. reticularis proper and O. Melchersi. It has a less elevated spire than the latter, with the angulation very slight and nearer the shoulder. The infrasutural pencilings are generally, but not always, present. Very fine parietal denticulations sometimes appear in the adult, but are generally absent. There is usually a purple or chesnut tinge on the lower columellar plaits, the upper one being always left white, or at least of a lighter shade. A remarkably large specimen measures *long.* 1·5, *long. spir.* ·27, *lat.* ·68, *div.* 90°.

Hab.—Panama, extremely rare, *C. B. Adams.*—Mazatlan; not uncommon; *L'pool Col.*

Tablet 2122 contains 3 sp. very rich dark shade.—2123, 3 sp. yellowish ground with dark markings.—2124, 3 do. markings lighter.—2125, 3 do. greenish ground, dark markings.—2126, 3 do. lighter.—2127, 3 do. triangulation appearing.—2128, 3 do. triangles distinct.—2129, 3 do. greenish ground.—2130, 3 do. light flesh colour.—2131, 3 do. markings more scattered.—2132, 3 sp. markings interrupted in the middle.—2133, 3 sp. young.—2134, 2 sp. mended after fracture.

Tablet 2135 contains 3 sp. of a solid variety, prevailing yellowish tint, markings faint.—2136, 3 do. markings very slight.

594. Oliva Duclosi, *Rve.*

Conch. Ic. pl. 19, sp. 44, f. 44.

Of this species only two small fresh specimens were found, which belong (so Miss Steere informs me) to the variety which has been described as O. Schumackeriana, *Beck.* It has the colouring of the dark variety of O. venulata, with the shape of O. reticularis; but is at once known from both by the distant, strong parietal teeth. The few columellar plaits are uncoloured, while the band above is deeply stained. *Long.* ·82, *long. spir.* ·2, *lat.* ·34, *div.* 70°.

Hab.—Philippines and Society Island; *Cuming.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2137 contains the larger sp.

Genus OLIVELLA, *Swains.*

Treatise 1840, p. 322.—*H. & A. Ad. Gen.* vol. i. p. 145.
Olivina, *D'Orb. Voy. Am. Mer.* p. 417.
Glandinaria, *Nutt. ms.*
Oliva, pars, *auct.*

595. Olivella undatella, *Lam.*

Oliva undatella, *Lam.* in *Ann. Mus.* vol. xvi. 1810, p. 326, no. 55:—*An. s. Vert.* vol. x. p. 630, no. 58.—*Ducl. Mon. Oliv.* pl. 5, f. 5—10:—*do.* in *Chén. Ill. Conch.* pl. 6, f. 5—10:—*Zool. Beech. Voy.* p. 131, pl. 36, f. 23, 26, 27.—*Rve. Conch. Ic.* pl. 25, f. 73.—*Mke.* in *Zeit. f. Mal.* 1851, p. 24, no. 105.—*C. B. Ad. Pan. Shells,* p. 55, no. 39.

Voluta tenebrosa, *(Mawe) Wood, Ind. Test. Suppl.* pl. 4, f. 38.
Olivella undatella, *H. & A. Ad. Gen.* i. 146.
Comp. Oliva zonalis, *Mke.* in *Zeit. f. Mal.* 1847, p. 183, no. 25; non *Lam.*

This species varies, as usual, in the elevation of spire and the comparative breadth: but its principal changes are in colouring; passing from pure white to rich purple or more usually with zigzag or undulating markings, pink on a white ground, or, (normally) with various shades of dark olive. The spiral band occupies more or less of the back, at a greater or less angle. Although the animal remained in many of the specimens, sufficiently fresh to swell out in water, no trace of operculum was found. The largest of the specimens measures *long.* ·68, *long. spir.* ·18, *lat.* ·3, *div.* 70°.
A broad sp. „ ·61, „ ·16, „ ·29, „ 80°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Panama; in sand and on mud banks at low water; *Cuming.*—Do. very rare, *C. B. Adams.*—Mazatlan; common; *L'pool & Havre Coll.*

Tablet 2138 contains 5 sp. pure white.—2139, 5 do. slight markings of pink.—2140, 5 do. pink markings stronger.—2141, 5 do. well developed.—2142, 5 do. markings fine and close.—2143, 5 do. pink passing into olive.

Tablet 2144 contains 5 sp. white with rare spots of olive.—2145, 5 do. olive spots more developed.—2146, 5 do. with broad white band.—2147, 5 do. olive markings undulating.—2148, 5 do. zigzag.—2159, 5 do. passing into general olive.

Tablet 2150 contains 5 sp., undulations absent or very faint; gray with white spiral band.—2151, 5 do. spiral band dark, gray passing towards purple.—2152, 5 do. dark purple.—2153, 5 do. purple changing into olive.—2154, 5 do. lighter.—2155, 5 do. dark olive changing into light.—2156, 5 do. light olive.

Tablet 2157 contains 5 sp., undulations more or less distinct; olive tinged with orange.—2158, 5 do. markings light, faint olive.—2159, 5 do. more distinct.—2160, 5 do. distinct.—2161, 5 do. dark olive.—2162, 5. do. white groundwork appearing.—2163, 5 do. white in larger spots.—2164, 5 do. colour darker.—2165, 5 do. rich olive.—2166, 5 do. shading into purple.

Tablet 2167 contains 4 sp. mended after fracture, colour changing.—2168, 3 sp. shewing variations of form.—2169, 2 do. spiral band varying.—(In all, 154 sp. with an appreciable difference between every two.)

596. OLIVELLA TERGINA, *Ducl.*

Oliva tergina, *Ducl. Mon. Oliv.* p. 7, pl. 2, f. 13, 14.—*Mke.* in *Zeit. f. Mal.* 1847, p. 183, no. 24:—do. 1851, p. 25, no. 107.—*Rve. Conch. Ic.* pl. 26, f. 80.
Olivella tergina, *H. & A. Ad. Gen.* i. 146.

This appears to be the common Olive of the Mazatlan fauna, as O. volutella is of that of Panama. The latter was abundant in the S. W. Mexican collection; but (as far as authentic information is concerned) is entirely unknown in the Gulf district. The great bulk of the specimens are sufficiently constant in characters to be easily recognized, having grey marking on a light ground; but these often assume a fawn or orange tint, or on the other hand a rich purplish brown, and are sometimes absent altogether. The dried animals, which were abundant and easily softened, gave no token of opercula. The West Indian analogue is O. conoidalis. An acuminated specimen measures *long.* ·72, *long. spir.* ·33, *lat.* ·28, *div.* 50°.
A broad sp. „ ·66, „ ·29, „ ·32, „ 50°.
The difference of divergence is in the later, not the earlier whirls.

Hab.—Conchagua; on sand banks; *Cuming.*—Mazatlan; in extreme profusion; *L'pool & Havre Coll.*

Tablet 2170 contains 8 sp. uniform, light passing into dark orange.—2171, 7 sp. do. with slight markings.—2172, 15 sp. light passing into dark flesh colour, nearly uniform.—2173, 15 do. with slight markings.—2174, 8 do. markings richly developed.—2175, 15 sp. darker shade, markings faint.—2176, 15 do. markings developed.—2177, 15 do. orange passing into grey.—2178, 15 do. light to dark.—2179, 8 sp. light to dark brown.—2180, 15 sp. changing to rich, nearly uniform, purple brown, with dark spire.

Normal state. Tablet 2481 contains 8 sp. light shade.—2182, 15 do. ordinary state.—2183, 15 sp. zigzag pattern developed.—2184, 15 sp. spire dark.

597. OLIVELLA ANAZORA, *Ducl.*

Oliva anazora, *Ducl. Mon. Oliv.* pl. 5, f. 3, 4.—*Mke.* in *Zeit. f. Mal.* 1851, p. 25, no. 106.—*Rve. Conch. Ic.* pl. 25, f. 74.
Olivella anazora, *H. & A. Ad. Gen.* i. 145.

Intermediate in character between the elevated, light variety of O. tergina, and O. petiolita. Known from the former by

the acuminate growth, continuity and delicacy of the zigzag pattern, and fineness of the labial teeth. In one specimen the labrum is finely corrugated within. *Long.* ·72, *long. spir.* ·3, *lat.* ·3, *div.* 45°.

Hab.—Mazatlan; 3 dead sp. only; *L'pool Col.*

Tablet 2185 contains a sp. tenanted by hermit crab.

598. OLIVELLA ?PETIOLITA, *var.* AUREOCINCTA.

?=Oliva petiolita, *Ducl.* in *Chén. Ill. Conch.* p. 5, pl. 1, f. 21, 22. Comp. O. mutica, *Say*, in *Rve. Conch. Ic.* pl. 29, f. 93, *a*, *b*. (Non O. mutica, *Ducl.* in *Chén.* p. 6, pl. 2, f. 5, 6: var. f. 7, 8:—. =Dactylidea mutica, *H. & A. Ad. Gen.* i. 146.)

O. t. "*O. muticæ*, Sayii," *simili, sed majore, spirâ acutiore; infra suturam zonâ extus aureâ et intus purpureâ cinctâ; lineis fusco-purpureis varie angulatâ, rarius undulatâ; callositate basali intensiore, magis declivi; plicis columellæ subobsoletis.*

As it is doubtful whether this shell be either the true O. petiolita or the true O. mutica, a name and diagnosis are added which may rank either as a variety or a species, according to further light. On comparing the Mazatlan shells with genuine W. Indian specimens from Dr. Cutting in the Bristol Museum, there scarcely appear grounds of specific separation; the most evident being the infrasutural golden band, the basal fold rather more slanting, and the plaits fainter than in most, but not all of the Caribbæan shells. *Long.* ·37, *long. spir.* ·16, *lat.* ·16, *div.* 50°.

Hab.—(O. petiolita.) Mexico [?ubi], Duclos.—(O. mutica) Barbadoes, *Dr. Cutting.*—(O. aureocincta) Mazatlan; very rare; *L'pool Col.*

Tablet 2186 contains 8 sp. exhibiting the principal varieties of pattern.

599. OLIVELLA INCONSPICUA, *C. B. Ad.*

Oliva inconspicua, *C. B. Ad. Pan. Shells*, pp. 50, 304, no. 34. Comp. O. oryza, *Lam. An. s. Vert.* vol. x. p. 631, no. 62.

This species was described by Prof. Adams from dead, immature specimens, apparently for geographical reasons. On comparing the only fresh adult found with O. oryza and its

congeners from the W. Indies, the differences appear extremely slight. The spire is rather narrower in the upper whirls, pure white; parietal callosity rather smaller; lower columellar plaits rather more projecting, especially in the young shell. Spire with 7 whirls, and a faint line of opaque white just below the suture. *Long.* ·25, *long. spir.* ·1, *lat.* ·09, *div.* 45°.

Hab.—Panama; 4 sp. among drift; *C. B. Adams.*—Mazatlan; traces of 20 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 2187 contains 2 perfect specimens, young and old.

600. OLIVELLA DAMA, *Mawe.*

Voluta Dama, *Mawe*, in *Wood, Suppl.* pl. 5, f. 37. (1828.)
Oliva lineolata, *Gray* in *Zool. Beech. Voy.* p. 131. (1839.)—*Rve. Conch. Ic.* pl. 23, f. 63.
Oliva purpurata, *Swains. Zool. Ill.* pl. 2, f. 1: teste *Hanl.* in *Wood*, ed. 2, p. 212.
Oliva gracilis, *Ducl. Monogr. Oliv.* pl. 1, f. 17, 18.
Olivella lineolata, *H. & A. Ad. Gen.* i. 146.

This shell is remarkable for its rich gloss, elevated spire and yet stumpy growth, rich violet within the mouth, and great twist of the columella inside, not visible in the front view. The long spire is nearly covered with a thick enamel; and the body whirl is painted with olive brown, orange or faint gray, leaving a white pattern more or less triangulated, with long infrasutural lines. The labrum is not often found quite perfect, and is much advanced in the middle. The largest specimen measures *long.* ·95, *long. spir.* ·44, *lat.* ·38, *div.* 50°.

A broad sp.	,,	·75,	,,	·32,	,,	·36,	,, 50°.
A slender sp.	,,	·8,	,,	·38,	,,	·32,	,, 40°.

Hab.—Mazatlan; abundant; *L'pool Col.*

Tablet 2188 contains 10 sp. dark olive brown tint.—2189, 9 do. lighter shade.—2190, 5 sp. flesh colour.—2191, 3 sp. orange tint.—2192, 5 sp. grey tint.—2193, 2 sp. almost white; one scarcely displaying either pattern or violet mouth.—2194, 3 sp. shewing interior.—2195, 3 sp. slender form.—2196, 3 stumpy form.—2197, 2 sp. mended after fracture.

601. OLIVELLA ZONALIS, *Lam.*

Oliva zonalis, *Lam. An. s. Vert.* vol. x. p. 631, no. 61:—*Ann.* p. 327, no. 58.—*Gray*, in *Zool. Beech. Voy.* p. 131, pl. 36, —

f. 25.—*Ducl. Monogr. Ol.* pl. 1, f. 3, 4.—*Rve. Conch. Ic.* pl. 29, f. 91.

Olivella zonalis, *H. & A. Ad. Gen.* i. 146.

The O. mutica, as figured by Duclos, more nearly resembles this than No. 598. It is distinguished in colour by two distinct purple brown bands on the back, with a deep stain on the parietal and another on the basal callosity. The diffused hue is light or dark, with the same variation on the spire, and yellowish below the suture. Spire more or less acuminated. Mouth very open. Columella as it were excavated, smooth; with one sharp, winding plait, bounding the siphonal notch. *Long.* ·32, *long. spir.* ·13, *lat.* ·15, *div.* 50°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2198 contains 3 specimens varying in colour.

Genus AGARONIA, *Gray.*

Zool. Beech. Voy. 1839, p. 131.—*H. & A. Ad. Gen.* vol. i. p. 142. Hiatula, *Swains.*—Oliva, pars, *auct.*

602. Agaronia testacea, *Lam.*

Oliva testacea, *Lam.* in *Ann. Mus.* vol. xvi. 1810, p. 324, no. 51:—*An. s. Vert.* vol. x. p. 627, no. 51.—*Val.* in *Humb. Rec. Obs.* vol. ii. p. 334.—*Ducl.* in *Chénu Conch. Ill.* pl. 3, f. 17, 18, (f. 19, 20, excl., teste *C. B. Ad.*)—*Rve. Conch. Ic.* pl. 18, f. 36.—*Mke.* in *Zeit. f. Mal.* 1851, p. 25, no. 108.—*C. B. Ad. Pan. Shells*, no. 38, p. 54.

Agaronia testacea, *H. & A. Ad. Gen.* i. 142.

=Oliva hiatula, pars, *Ducl. Mon. Oliv.* pl. 3, f. 15, 16.—Non *Lam. An. s. Vert.* vol. x. p. 627, no. 52.

Agaronia hiatula, [*Gray*, non] *Lam. Zool. Beech. Voy.* p. 132.

Having very carefully examined many hundreds of Mazatlan specimens, and compared them with a series sent from the Gambia by Chief Justice Rankin,* and also with the Bordeaux fossils assigned to O. hiatula by Deshayes and Duclos, it would appear that the judgment of Lamarck can be maintained

* Of this valuable and very reliable collection, which I had an opportunity of examining on its first arrival, the principal part is to be found incorporated in the general Museum of the Bristol Institution.

against that of Gray and Duclos, though not on the grounds on which the species was first instituted. The general style of painting and habit of growth varies between the Atlantic and Pacific shells; but individuals will be found of each so closely passing into each other that the usual characters are not sufficient to distinguish them. The elevation of spire and expansion of the mouth are extremely variable, as will be seen by the measurements given below. Moreover the white colour of the plaits which is said to distinguish A. testacea, is sometimes changed to a purple brown. But when A. testacea is tinted, the colour begins at the base and proceeds upwards; while in A. hiatula it begins above, and always leaves the last plait white. Again the spiral band, which is light in A. hiatula, is very dark in A. testacea. But the only reliable distinction is in the shape of the band and plaits. The band in A. hiatula begins somewhat higher up the mouth, thus occupying a larger proportional space over the back: and the plaits, which in A. hiatula are close, numerous, small, and ascending the columella without angle, are in A. testacea fewer, and making a slight angle with a few intercalary folds as they enter the shell. In these respects, the fossil species agrees with the African, which appears also from the E. coast, teste *Capt. Owen*, B. M. A shell obtained from a shop along with a number of E. Indian species, agrees in almost all respects with A. testacea, but has the plaits more numerous, with the last fold more distinctly marked off, and entering the mouth at a greater angle, with very numerous intercalations. The surface of A. testacea is very minutely covered with striæ of growth, and crossed sometimes by minute close spiral lines. The same structure is seen on a finer scale on A. hiatula. Both species want the ordinary glossy aspect of Olividæ. There is a conspicuous wave, a little below the middle of the outer lip, in the region of which the shell has generally a dead aspect. No opercula were found. The posterior canal is very deeply channeled at the junction, and the part of the parietal callosity which is above the suture has, almost always, a deep stain. The young shell is often prettily marked with dark olive-purple spots, which occasionally run into irregular zigzag lines. The smallest sp. is ·65 long: the largest measures *long.* 1·96, *long. spir.* ·47, *lat.* ·86, *div.* 60°.

A broad sp.	„	1·6,	„	·29,	„	·76,	„ 70°.
An acuminate sp.	„	1·49,	„	·55,	„	·58,	„ 40°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Real Llejos; in sandy mud, 6 fm.; *Cuming.*—Panama; 20 dead sp.; *C. B.*

Adams.—S. W. Mexico, *P. P. C.*—Mazatlan; abundant; *L'pool & Havre Coll.*

Tablet 2199 contains 5 sp. broad form.—2200, 9 sp. ordinary state.—2201, 5 do. rather more slender.—2202, 5 sp. slender growth.—2203, 3 sp. very slender.—2204, 2 sp. extremely acuminate.

Specimens shewing colour. Tablet 2205 contains 1 sp. reddish tinge, base light, acuminate, closely resembling A. hiatula.—2206, 2 sp. uniform olive grey.—2207, 3 sp. faint markings.—2208, 3 sp. highly coloured.—2209, 3 sp. columella deeply stained.—2210, 1 sp. parietal callosity not stained.

Tablet 2211 contains 2 sp. columellar plaits twisted.—2212, 1 sp. with slight parietal teeth.—2213, 5 sp. mended after fracture.

Family PURPURIDÆ.

Operculum ovate or somewhat elongated, with the nucleus in the middle of the outer margin: often irregular in its edges, without external sculpture of growth, and resembling a chip of wood.

Genus PURPURA, *Lam.*

603. Purpura patula, *Linn.*

Buccinum patulum, *Linn. Syst. Nat.* ed. 12, p. 1262.—*Dillw. Descr. Cat.* vol. ii. p. 609, no. 52.

Purpura patula, *Lam. An. s. Vert.* vol. x. p. 61, no. 3.—*Blainv. Nouv. Ann. Mus.* vol. i. p. 224, no. 48.—*Sow. Gen.* f. 1.—*Kien. Icon. Conch.* p. 91, no. 57, pl. 24, f. 66.—*Rve. Conch. Syst.* vol. ii. p. 22, pl. 259, f. 1:—*Conch. Ic.* pl. 1, sp. 3.—*Mke.* in *Zeit. f. Mal.* 1850, p. 180, no. 47.

Le Pakel, *Adans. Sen.* pl. 7, f. 3.

Purpura pansa, *Gould, Mex. & Cal. Shells,* p. 33.

[For other references, v. *Desh.* in *Lam.* loc. cit.]

This well known shell was not found by Prof. Adams; but Dr. Gould, having received some very young Pacific specimens, has endeavoured to find marks of specific difference between them and his Atlantic specimens. Having carefully examined many hundred Mazatlan shells, I am entirely unable to coincide with Dr. Gould's opinion; his diagnosis of the Atlantic type exactly fitting the majority of the Mazatlan specimens,

while that of P. pansa applies as exactly to certain small specimens of P. patula collected by Dr. W. B. Carpenter at St. Vincent's, W. I. The magnificent shells brought by Mr. Cuming from the Philippines, are also quite indistinguishable from the Mazatlan type. Shell extremely variable; with the spire sometimes exserted as in P. columellaris; sometimes flattened, or even decollated. It is commonly covered with Balani, and is also a favourite station of Acmæa mitella. Along with its parasites, it is frequently encrusted by a thin violet layer, apparently of corallinous growth. Operculum small for the size of the aperture, looking like a chip of rosewood outside, within of a purple black: muscular scar large, with layers of growth, and the whole surface microscopically striated transversely. The largest of the specimens measures *long.* 3·24, *long. spir.* ·64, *lat.* 2·22, *div.* 110°.

An elevated sp.	„	2·62,	„	·93,	„	1·5, „ 60°.
A broad sp.	„	2·34,	„	·44,	„	1·9, „ 110°.

Hab.—Senegal; on the rocks of Cape Manuel; *Adanson.*—Near Bonifacio, Corsica, *Payraudeau.*—Jamaica, Barbadoes, *Plée,* (Voyageur naturaliste de Muséum.)—St. Vincent's, W. I., *W. B. Carpenter.*—Philippines Is., *Cuming.*—Mazatlan, *Botta:*—Do.; not uncommon; *L'pool Col.*

Tablet 2214 contains 5 sp. different ages, elevated spire.—2215, 9 sp. normal shape, (the largest with operc.)—2216, 3 sp. flattened.—2217, 3 do. decollated, one with scarcely more than one whirl left.—2218, 1 sp. shewing violet deposit, and mark of Acmæa mitella.—2219, 1 sp. after hot acid, inside with light band.—2220, one separate operculum.

604. PURPURA COLUMELLARIS, *Lam.*

An. s. Vert. vol. x. p. 62, no. 4.—*Encycl.* pl. 398, f. 3 *a, b.*—*Blainv. Nouv. Ann. Mus.* vol. i. p. 220, no. 40, pl. 10, f. 7.—*Kien. Icon. Conch.* p. 78, no. 49, pl. 20, f. 58.—*Schub. & Wagn. Chemn.* p. 142, pl. 232, f. 4079-80.—*Rve. Conch. Ic.* pl. 2, sp. 9.

Normal specimens of this shell are extremely different from P. patula, being small, extremely thick, with an elevated spire, granulated tubercles, mouth not open, (often contracted as in Nematura,) labium with a columellar fold as in Cuma tectum, labrum beautifully crenulated with black over a chesnut ground, and furnished within with five (or six) stout tubercles.

But in some few specimens the labial callosity is no larger than in some of P. patula, jun.: the labral teeth are scarcely developed: the mouth is more open, and the sculpture less decided. It then so closely resembles young specimens of P. patula that they can only be separated by a balance of characters. The opercula examined scarcely differ from those of P. patula except in their lighter colour. There were however none of P. patula, jun. of the same size to compare with them. The largest normal specimen measures *long.* 1·58, *long. spir.* ·5, *lat.* 1·14, *div.* 90°.

An elevated sp.	„	1·42,	„	·52,	„ ·93,	„ 70°.
The largest, abnorm.,	„	2·12,	„	·67,	„ 1·5,	„ 90°.
The smallest adult	„	·97,	„	·46,	„ ·58,	„ 70°.

Hab.—Galapagos, *Cuming.*—Mazatlan; not uncommon, often rubbed, but rarely encrusted; *L'pool Col.*

Tablet 2221 contains 4 sp. normal.—2222, 1 do. with operculum.—2223, 4 sp. elevated spire.—2224, 5 sp. aperture contracted.—2225, 7 do. aperture deformed.—2226, 2 sp. sculpture well developed.—2227, 4 sp. columellar fold evanescent.—2228, 3 do. closely approaching P. patula.—2229, 3 opercula, of which one is abnormal, with subcentral nucleus.

605. PURPURA MURICATA, *Gray.*

Monoceros muricatum, *Rve. Conch. Ic.* pl. 2, sp. 7.
Monoceros muricatus, *Mke.* in *Zeit. f. Mal.* 1850, p. 179, no. 45.
=Purpura cassidiformis *(Blainv.) D'Orb. B. M. Cat. Moll.* p. 41, no. 361.
=Purpura truncata, *Ducl.* teste *Mke.*

This shell rests its claim to a place in the genus Monoceros on a projecting wave in the labrum between the canal and the first costal depression. Of the true Acanthine Purpuridæ, the almost peculiar possession of the West Coast of America, not a single specimen occurred. The few Mazatlan specimens of this shell are strongly foliated over the principal spiral ribs, and almost always encrusted. The operculum is not so small in proportion as in P. patula, with the margins well rounded, and of a reddish chocolate colour. "Deckel hornig, biegsam, durchscheinend," *Mke. Long.* 2·52, *lnng. spir.* ·54, *lat.* 2·2, *div.* 11°.

Hab.—St. Elena, *Cuming.*—Mazatlan; extremely rare; *L'pool & Havre Coll.*

Tablet 2230 contains one of three very small shells, containing 5 nuclear whirls, remarkable for two very fine spiral keels and a shagreening of the surface, and (in this specimen alone) for a long process from the labrum not seen afterwards. The normal portion displays a sculpture which may develop into P. muricata.

Tablet 2231 contains an adult sp. with Bryozoa, &c.

606. PURPURA BISERIALIS, *Blainv.*

Blainv. Monogr. Purp. in *Nouv. Ann. Mus.* vol. i. p. 238, no. 75, pl. 11, f. 11.—*Mke.* in *Zeit. f. Mal.* 1850, p. 180, no. 49.—(Non. *Hanl.* in *Rve. Conch. Ic.* pl. . sp. .)

= Purpura bicostalis, *Rve. Conch. Ic.* pl. , sp. 28.—*Mke. loc. cit*, p. 181, no. 50.—*P. P. C., Cat. Prov.*—(Non *Blainv. loc. cit.* p. 238, no. 76:—*? Lam. An. s. Vert.* vol. x. p. 82, no. 34.—Non *D'Orb. B. M. Cat. Moll.* p. 42, no. 365, [? + 356 pars.])

= Purpura undata, *Val. Rec. Obs.* vol. ii. p. 315.—*C. B. Ad. Pan. Shells*, p. 80, no. 76:—non *Lam. An. s. Vert.* p. 67, no. 10:—*D'Orb. B. M. Cat. Moll.* p. 42, no. 364.

? Var. = Purpura undata, *Eyd. & Soul. Voy. Bonite*, pl. 39, f. 17—19:—*B. M. Cat.* p. 24, no. 192.

+ Purpura hæmastoma, *Mke.* in *Zeit. f. Mal.*, 1847, p. 182, no. 15.—Comp. Buccinum hæmastoma, *Linn., Syst. Nat.* p. 1202.

+ Purpura consul, *Mke. loc. cit.* 1850, p. 180, no. 48.—(Non *Lam. loc. cit.* p. 63, no. 6.)

Comp. Purpura hæmatura, *Val. Voy. Venus*, pl. 8, f. 3, 3*a*.

Comp. P. Floridana, *Conr. Journ. Ac. Nat. Sc. Phil.* vol. vii. pt. 2, 1837, p. 265, pl. 20, f. 21. = P. hæmastoma, *D'Orb. B. M. Cat. Moll.* p. 41, no. 356, (maxima pars.)

M. Blainville having described this shell from (young) Mazatlan specimens, brought by *M. Botta*, at the same time stating that it represents P. hæmastoma on the W. Coast of America, "differing in its smaller size, and by its constantly having 7 pliciform tubercles on the labrum" (the figure however presenting 8), there can hardly be a doubt that his species is that here intended, and not the shell attributed to it by Messrs. Hanley and Reeve, which has but a remote resemblance to Blainville's figure.

Whether or not the Pacific specimens of the hæmastomoid type are distinct from the Atlantic, is not yet agreed upon by naturalists. That the Mazatlan specimens are conspecific, I cannot doubt after a careful scrutiny of more than 500 specimens. Whether the Lamarckian P. bicostalis be the West American shell, as supposed by Reeve, or the E. Indian, as decided by Blainville, cannot be determined by his diagnosis. But as the W. coast shells were scarcely known in Lamarck's days (except those brought by Humboldt & Bonpland, which are specified as such,) when there is a doubt, it seems fair to give the benefit of it to the old East and West Indian species. Supposing the local forms to be distinct, it is proposed to retain Blainville's name for the W. American shells; leaving the P. bicostalis for the E. Indian, P. hæmastoma for the Europæan, and P. Floridana for the W. Indian types. The P. undata of *Lam.* is almost certainly the W. Indian species (not hæmastomoid) well figured (among others) by Kiener. This does not occur on the West Coast. The Mazatlan shells are either (1) very depressed, like P. deltoidea, thick, of a uniform gray colour, with distant coarse spiral striæ, stout tubercles, and wholly orange mouth, (P. consul of *Menke* not *Lam.)*: or (2) almost wholly assuming the usual appearance of P. hæmastoma: or (3) of a Buccinoid shape, with very faint tubercles, richly variegated brownish colour, shewing at the mouth, and comparatively thin texture, (P. undata of *Val.* not *Lam.)*: or (4) of the same shape, with stout tubercles, and back richly coloured, as described by Reeve under P. bicostalis. Rarely the shell is almost wholly of a reddish brown. When painted, the pattern is extremely various, being laid on sometimes in irregular patches, sometimes in variegated threads between the spiral striæ. These vary in width and depth, but are never so close as in the specimens observed from the Atlantic. Mr. Hanley has also pointed out that the striæ are punctured; an appearance due to the intersection of faint striæ of growth, which follow the crenated form of the mouth, and often are but faintly discernible in the coarsely grooved *consul*oid specimens. The mouth is often nearly smooth and white within, till near the labrum, where orange develops, with spiral ridges sometimes displaying an inner row of tubercles. But sometimes (especially when young,) it is deeply lirate over the whole surface, which is brown, while the swollen ribs are light yellow. The labium has always more or less of an orange deposit, wrinkled near the base, and with an infrasutural rib. There are five smooth apical whirls, sometimes

fixed rather slanting on the rest, and deciduous. The next are furrowed with about ten strong ridges, of which one makes an angular keel, decussated by five ridges of growth. Afterwards the keel becomes tuberculous, and numerous intercalary lines appear while the ridges become obsolete. The shell often develops two fainter rows of tubercles below the principal ones. The operculum differs from that of P. patula in being much lighter, of a reddish brown; inside more coarsely corrugated transversely, with the nucleus of the scar indented; outside with two wings faintly marked off by diagonal lines. The largest specimen found, (allowing for the decollated apex,) measures *long.* 3·7, *long. spir.* 1·25, *lat.* 2·5, *div.* 75°.

A depressed sp. „ 2·1, „ ·58, „ 1·64, „ 100°.
An elevated sp. „ 2·35, „ ·85, „ 1·6, „ 70°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Monte Christi; under stones at low water; *Cuming.*—Panama; common, under stones, near low water mark of neap tides; *C. B. Adams.*—Mazatlan; extremely abundant; *L'pool & Havre Coll.*

Tablet 2232 contains a small shell, ·13 by ·07, probably belonging to this species. It consists of 5 whirls, of which the four first are nuclear and nearly smooth; the fifth is strongly costate, with 9 rounded ribs, of which two appear larger than the rest, and are crossed by fine layers of growth. Colour ashy, spotted with purplish brown.

Tablet 2233 contains 6 sp. depressed variety.—2234, 6 do. more elevated.—2235, 4 do. fainter knobs.—2236, 5 sp. elevated, uniform tint.—2237, 4 do. faint knobs.—2238, 5 sp. do. painted.—2239, 3 do. strong knobs.—2240, 7 sp. strongly lirate.—2241, 7 sp. shewing varieties of markings.—2242, 2 sp. uniform reddish brown.—2243, 3 sp. mended after fracture.

Tablet 2244 contains the only very young sp. certainly identified.—2245, 6 normal opercula. Many will also be found with the shells.—2246, 1 very large do. probably belonging to this species, but without the muscular indentation.—2547, 2 do. with very coarse corrugations.

607. PURPURA TRISERIALIS, *Blainv.*

Monogr. Purp. in *Nouv. Ann. Mus.* p. 226, no. 53, (diagn. Gallic,* tab. null.) 1832.

* As English naturalists are acquainted with the French language, it is thought that this description should be allowed priority.

Purpura speciosa, *Rve. Conch. Ic.* pl. 11, f. 56.—*Val. Rec. Obs.* vol. ii. p. 316, (1833.)
(Purpura) Thalessa speciosa, *H. & A. Ad. Gen.* i. 127.
=Purpura centiquadra, *Val. ms.*

The species was described by Blainville from a single young specimen brought from "California" by *M. Botta*. Although not figured, its recorded analogy with the W. Indian P. deltoidea, orange mouth, and numerous close violet bands of colour, leave no doubt of the identity of the shell. It is said to be finely striated at the base, but this character may be accidental. The three rows of nodules are generally seen in the young shell, but often only one appears on the adult. The violet bands are broken up into rectangular dots. The labrum is not toothed, but sometimes finely serrate at the margin. Operculum purple black, with lighter wings: outside very glossy. Scar very finely corrugated transversely, with the few lines of growth somewhat rectangular. Most of the specimens are about an inch long: a giant measures *long.* 1·82, *long. spir.* ·58, *lat.* 1·46, *div.* 90°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Mazatlan; 1 young sp.; *Botta.*—Do.; rare, generally incrusted with coralline; *L'pool Col.*

Tablet 2248 contains 3 sp. triserial.—2249, 3 do. with two rows becoming obsolete.—2250, the largest specimen.—2251, 2 separate opercula; two others are in situ in the shells.

608. PURPURA TRIANGULARIS, *Blainv.*

Monogr. Purp. in *Nouv. Ann. Mus.* vol. i. 1832, p. 223, no. 46 (bis), pl. 11, f. 4, (t. jun.)—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 115, no. 82.
Purpura Carolensis, *Rve. Conch. Ic.* pl. 11, sp. 57, 1846.—*C. B. Ad. Pan. Shells*, p. 76, no. 69.
(Purpura) Tribulus Carolensis, *H. & A. Ad. Gen.* i. 126.

The solitary young specimen brought by *M. Botta* from Mazatlan, and figured by Blainville, was overlooked by Mr. Reeve, who named it from Charles Is., Galapagos, whence it was brought by Mr. Cuming. It is easily distinguished from P. triserialis by its more rounded outline, white mouth, double row of tubercles, infrasutural spiral rib forming a slight posterior canal, finely plaited labrum, 4-dentate internally, labium finely corrugated near the base, and surface crowded with

minute spiral striæ. The operculum when perfect presents the remarkable feature of a finely plaited border round the labral external margin. An unusually elevated specimen measures *long.* 1·23, *long. spir.* ·36, *lat.* ·92, *div.* 80°.
A normal sp. „ ·1·2, „ ·27, „ 1·06, „ 100°.
A depressed sp. „ ·84, „ ·05, „ ·86, „ 170°.

Hab.—Mazatlan, 1 sp. *Botta.*—Charles Is., Galapagos; under stones at low water; *Cuming.*—Taboga; very rare, same station, and in crevices of rocks near low water mark; *C. B. Adams.*—Mazatlan; rare, generally encrusted with coralline; *L'pool Col.*

Tablet 2252 contains an adult sp. with Bryozoa, remarkable for a shagreening of the surface, and (in this specimen alone) for a long process from the labrum not seen afterwards. The normal portion displays a sculpture which may develop into P. muricata.

Tablet 2253 contains 3 sp. elevated.—2254, 3 do. normal.—2255, 3 do. depressed.—2256, 1 sp. with operculum, and one separate operculum.

Genus CUMA, *Humph.*

Swains. Treat. 1840, p. 307:—*H. & A. Ad. Gen.* vol. i. p. 133. A convenient, though not very distinctly defined group of Purpuræ *auct.* The plait in the typical species, Cuma tectum, (S. W. Mexico, *P. P. C.*) does not appear of more generic importance than the fold in Purpura columellaris.

609. Cuma kiosquiformis, *Ducl.*

Purpura kiosquiformis, *Ducl.* in *Ann. Sc. Nat.* vol. xxvi. p. 107, pl. 1, f. 5, 1832.—*Kien. Icon. Conch.* p. 59, pl. 15, f. 40.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 96, no. 60.—*Eyd. & Soul. Voy. Bon. Moll.* pl. 39, f. 23-5:—*B. M. Cat.* no. 194, p. 24.—*Rve. Conch. Ic.* pl. 7, f. 31, var.—*Gray, Fig. Moll. An.* pl. 87 *a*, f. 6.—*C. B. Ad. Pan. Shells*, p. 77, no. 71.
Var. = P. scalariformis, *D'Orb. B. M. Cat. Moll.* p. 41, no. 359: (? = P. s., *Lam. An. s. Vert.* vol. x. p. 73, no. 20).—= Purpura, sp. ind., *C. B. Ad.* loc. cit. p. 78, no. 72.
Cuma kiosquiformis, *H. & A. Ad. Gen.* i. 134; pl. 14, f. 3.

This remarkably variable shell is sometimes short and angular like the Turbinelloid C. tectum: sometimes with the periphery

rounded, in shape like Purpura; sometimes extremely elongated, the whirls scarcely touching. It is known in all stages by the loose separate laminæ of growth which pass over the suture connecting the whirls. When in fine condition, it has one principal row of about 8 tubercles, spirally flattened, more or less conspicuous; and generally, another smaller row below. When these are developed, and the first row smaller, the resemblance to P. biserialis is remarkable. The whole surface has crowded spiral striæ, closely imbricated with not-obtuse semicircular scales, crenulating the margin. This, as well as the shell generally, is marked with blackish brown. Canal recurved, twisted, generally forming an umbilical chink. Operculum purpuriform, dark chesnut brown, with extremely minute transverse radiating striæ, within and without. These corrugate the muscular scar, which has rounded costæ of growth. The few specimens found in the Mazatlan collection were for the most part much worn, and often the location of Ostrea conchaphila and Balani. A very young depressed sp. measures *long.* ·98, *long. spir.* ·4, *lat.* ·8, *div.* 80°.
The largest sp. „ 2·56, „ 1·18, „ 1·7, „ 55°.
A scalaroid sp. „ 1·68, „ ·92, „ 1·08, „ 40°.

Hab.—[New Holland; Duclos, Kiener, &c. ?]—Panama; on rocky places at low water; *Cuming.*—Do.; abundant from half tide nearly up to high water mark of neap tides, on rocks and on lower parts of trunks and about roots of trees growing from a stony bottom; *C. B. Adams.*—La Paz, *Lieut. Green.*—Mazatlan; very rare; *L'pool Col.*

Tablet 2257 contains 2 sp. normal state, one with operculum in situ.—2258, 1 sp. spire elevated.—2259, 1 sp. periphery rounded.—2260, the most effuse specimen, (=Purpura, sp. 72, *C. B. Ad.*) Between these extremes, a regular gradation was found.—2261, 1 operculum.

610. Cuma costata, *Blainv.*

Purpura costata, *Blainv. Nouv. Ann. Mus.* 1832, p. 231, no. 63, pl. 11, f. 8.—*Kien. Icon. Conch.* p. 61, no. 38, pl. 17, f. 51.
?=Purpura diadema *(Lam.* teste *Rve.* in *Ind.) Rve. Conch. Ic.* pl. 12, sp. 62, 1846.—Cuma d. *H. & A. Ad. Gen.* i. 134.
Comp. Cuma calcar, *Brod.* in *Mus. Cum.*

C. t. plus minusve rhombicâ, spirâ plus minusve elevatâ; albidâ, intus interdum violascente, interdum pallide ochraceâ,

seu rarius virescente ; superne conspicue angulato, carinâ tuberculosâ ; tuberculis plerumque viii. *compressis, plus minusve conspicuis, costis radiantibus, sæpe subobsoletis, convenientibus ; lirulis spiralibus confertis, supra carinam minus conspicuis, rotundatis, squamosis cinctâ, quarum interdum* iii. *infra carinam majores, quasi carinulæ, squamis majoribus tuberculis convenientibus ; squamulis lirularum confertissimis, acutioribus, arcuatis, labrum acutum crenulantibus ; labio simplici, haud extante ; canali elongatâ, apertâ ; costâ plus minusve contortâ, rimam umbilicalem sæpe formante : operculo pyriformi, arcuato, nigro-rufescente ; margine tenui, diaphano, intus rubro tincto ; cicatr. musc. lineis incrementi paucis irregulariter concentricis.*

The figures of Blainv. and Kien., drawn from a supposed unique specimen, represent the usual state of this pretty little species much better than that of Reeve which (if the same species) is an aberrant form.* The shell varies extremely in shape and strength of sculpture, but presents a general lozenge outline from the keel which is always conspicuous. Whether the secondary keels are developed on the basal part of the whirl, depends on the individual, and is rarely the case in young shells. Almost all the numerous specimens were copiously encrusted with coralline, so that the beautiful markings are rarely seen except near the mouth. The largest of the specimens measures *long.* 1·28, *long. spir.* ·6, *lat.* ·88, *div.* 60°.

A young acuminated sp.	·78,	„	·32,	„	·47,	„ 50°.
A depressed sp.	„ ·63,	„	·22,	„	·45,	„ 70°.

Hab.—Mazatlan, *Botta.*—(P. diadema) Payta; on the reefs: *Cuming.*—Mazatlan; common; *L'pool Col.*

Tablet 2262 contains 6 sp. basal keels developed, spire elevated.—2263, 5 do, less elevated.—2264, 5 do. depressed.—2265, 5 do. basal keels scarcely marked.—2266, 5 sp. base plain, much depressed.—2267, 6 do. less depressed.—2268, 4 do. acuminated.—2269, 6 sp. shewing the lip in different stages of growth.—2270, 3 do. mouth highly coloured.—2271, 1 do. canal twice formed.—2272, 2 sp. much incrusted.—2273, 3 sp. adhesions incommoding the mouth.—2274, 4 sp. mended after fracture.—2275, 1 sp. curiously worm-eaten.—2276, 8 normal opercula.—2277, 4 do. somewhat irregular; one with nucleus subcentral.

* Perhaps the tickets of the types in Mus. Cuming have been displaced. Reeve gives the shell as S. American: but the "Cuma diadema, *Lam.*" of the collection is ticketed "Mauritius," and is certainly distinct from the Mazatlan shell. The latter more nearly resembles C. calcar, *Brod.* in the collection.

Genus RAPANA, *Schum.*

Essai, no. 57, 1817. Shell Pyruloid: operculum Purpuroid.

Subgenus RHIZOCHEILUS, *Steens.*

Steenstrup, Afh. Ac. Copenh. May, 1850.—*H. & A. Ad. Gen.* vol. i. p. 135; (diagn. *auct.*)
Rapana, pars, *Phil. Handb. Conch.* p. 487.
Murex, pars, et Purpura, pars, *auct.*

611. Rhizocheilus nux, *Rve.*

Murex nux, *Rve. Conch. Ic.* pl. 35, sp. 181: (diagn. nunc auct.)*
Murex (Ocinebra) nux, *H. & A. Ad. Gen.* i. 75: [non Purpura (Polytropa) nux, *loc. cit.* i. 128.]

R. t. valde solidâ, irregulari, albâ; anfr. nucleosis lævibus, primo decollato; spirâ seu depressâ, seu elevatâ; costis radiantibus v.-viii. *tumidis, rotundatis, plus minusve prominentibus; liris confertis spiralibus squamosis, interstitiis profundis, plus minusve angustis; squamulis confertissimis, rotundatis: aperturâ ovoideâ, labro acuto, à squamulis crenulato, intus denticulato; labio haud tenui, haud producto; canali angustâ, profunde excavatâ, recurvatâ; costâ canaliferâ solidâ, intortâ, rimam umbilicalem monstrante: operculo subpyriformi, nigro-fusco, margine tenui, diaphano; nucleo in marginis externi medio sito.*

That this curious and very variable shell is not a Murex, is shewn by its Purpuroid operculum and want of varices. It is intermediate in character between Vitularia salebrosa and Cuma costata, more nearly approaching the latter. Although only bearing a general resemblance to the typical Rhizocheilus, yet as the species brought together by Messrs. Adams (under the subgeneric name Coralliophila) form a natural assemblage

* The species in this group are so similar to each other, but the shells in each so variable, that their discrimination is a matter of extreme difficulty: especially as the types in Mus. Cuming have been so corroded by the acid process that the minute sculpture (which is one of the best criteria) is no longer visible. The type of Murex nux, *Reeve*, may therefore stand for whatever is wished: the Mazatlan shell is called after it on Mr. Cuming's authority. The Panama shell brought by Mr. Bridges (at first named R. distans, Mr. Cuming regarding them as distinct) appears to be one among the many varieties of "R. niveus, *A. Ad.*": nor does the acid allow of a distinction being evident between this and R. nux. The R. Californicus may be distinct, having a very large body whirl, with the ribs almost obsolete; but this again has lost its markings under the acid. [The Leucozonia Californica, Gulf of Cal. *Lieut. Shipley*, appears more nearly allied to Lathirus than to Leucozonia cingulata.]

not easily located elsewhere, it is here used in the enlarged sense. The present species approaches very nearly to R. costularis, *Lam.*, R. gibbosus, *Rve.*, and R. Californicus, *A. Ad.* It is known at once from Cuma costata by the roundness of the ribs, want of keel, and the greater narrowing and recurving of the canal. Although apparently of sedentary habits, not eating away obstructions in its shell close to the columella, it is remarkably free from the incrustations which usually cover C. costata. The form of the canal often irregularly approaches Cassis. The operculum closely resembles that of Cuma costata, differing in being somewhat more elongated, the pale margin not so distinctly marked off, and the surface rougher. The largest sp. measures *long.* 1·12, *long. spir.* ·54, *lat.* ·67 *div.* 55°.
A broad sp. ,, ·84, ,, ·38, ,, ·65, ,, 65°.
The most depressed sp. ·57, ,, ·22, ,, ·56, ,, 80°.

Hab.—Mazatlan; rare; *L'pool Col.*

Tablet 2278 contains 3 sp. depressed form.—2279, 3 do. normal shape.—2280, 3 do. acuminated. In the largest, a portion of the canaliferous rib remains, not eaten away, overhanging the labium.—2281, 4 sp. shewing the labrum at different stages of the costæ.—2282, 4 sp. with 5, 6, 7 and 8 ribs respectively.—2283, 2 sp. shewing extremes of sculpture.—2284, 2 sp. with opercula.—2285, 2 sp. with adhesions.—2286, 2 sp. mended after fracture: one has formed a second canal; the other has twisted it back at an angle of 110°.

Genus VITULARIA, *Swains.*

Treatise, p. 297, 1840.—*H. & A. Ad.* (inter Murices, operc. ign.) *Gen.* vol. i. p. 74. Shell with very irregular varices; operculum Purpuroid.

612. Vitularia salebrosa, *King.*

Murex salebrosus, *King, Zool. Journ.* vol. v. p. 347.—*Sow. Conch. Ill.* pl. 65, f. 48.—*Kien. Icon. Conch.* p. 121, pl. 47, f. 1.—*Lam. An. s. Vert.* vol. ix. p. 613, no. 84.—*Rve. Conch. Ic.* pl. 24, f. 98.—*Mke.* in *Zeit. f. Mal.* 1850, p. 187, no. 68,—*C. B. Ad. Pan. Shells*, p. 125, no. 142.
Fusus salebrosus, *Forbes, Proc. Zool. Soc.* 1850, p. 274.
Murex vitulinus, *Gray, Zool. Beech. Voy.* pl. 33, f. 4, 6; [non *Lam. loc. cit.* p. 595, no. 53:—= Murex purpura *(Chemn.) Desh.* in notâ: = M. miliaris, *Gmel. Dillw. Wood.*]

The true M. vitulinus, *Lam.* appears to be an African shell, closely resembling but distinct from the very variable species of W. America. The Mazatlan specimens are very rarely white, or banded with purple brown; but almost always of an auburn tint, especially at the border of the mouth, which is white within. Shape generally with the spire moderately elevated, sometimes turrited, sometimes depressed and pyriform. Upper whirls angular, generally flattened, with regular varical ridges as in Trophon. Nuclear whirls smooth, turrited, fixed slanting, deciduous. Normal whirls scabrous, generally developing a row of obtuse nodules on the shoulder, which sometimes elongate into faint costæ. Varices foliaceous, extremely irregular, rarely seen on the spire, from one to six on the last whirl, at variable distances. Labium smooth, with an infrasutural tooth as in Pisania. Canal more or less elongate. The creature appears to be of sluggish habits, being frequently worm eaten, and encrusted with Bryozoa, &c. though not with coralline. It is very rarely pierced by Lithophagus and Gastrochæna. The operculum is diamond-shaped, with two short sides above, and two long ones below, angles rounded: outside with ridges of growth; inside with a very large muscular scar, reddish, corrugated, with a few lines of growth; a loose yellowish border is seen round the outer edge. The largest sp. measures *long.* 3·84, *long. spir.* 1·4, *lat.* 2·1, *div.* 60°.

An elevated sp. „ 3·84, „ 1·98, „ 1·8, „ 40°.
A pyriform sp. „ 2·95, „ ·77, „ 1·7, „ 80°.

Hab.—S. America, Sowerby, Deshayes.—Panama; under stones, not far from low water mark; *C. B. Adams.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 2287 contains 4 sp. adolescent.—2288, 3 sp. single varix, depressed.—2239, 3 do. normal.—2290, 2 do. elevated.—2291, 3 sp. with 2 varices, depressed.—2292, 2 do. normal.—2293, 2 do. elevated.—2294, 3 sp. normal, varices 3 or more.—2295, 2 do. elevated varices 3 or 6.—2296, 4 sp. shewing changes of colour.—2297, 3 do. shewing extremes of sculpture.—2298, 1 sp. elongated canal.—2299, the largest sp., stout columellar callosity, apparently deposited as a guard against worms.—2300, an elongated sp. with a similar callosity.—2301, a sp. with fresh canal, after fracture, bent as in Cassidaria.—2302, a sp. which, in mending a hole between two varices, has protuded a second lip, with a passage to the inside (as in Trochotomus.)—2303, 3 separate opercula. The youngest sp. in tablet 2287, and one in tablet 2297 have their opercula in situ.

Genus NITIDELLA, *Swains.*

Nitidella, *Swains.* (shell.)—Nitidella, *Gray*, (operc.)
Buccinum, pars, *Lam.*
Columbella, pars, *auct.*

Testa ut in Mitrellâ (Risso, non *Swains. H. & A. Ad. Gen.* vol. i. p. 183;) *interdum decollata; labio continuo, haud crenato. Operculum elongatum, nucleo laterali, ut in Purpurâ formatum.*

The operculum of the following species being distinctly Purpuroid, it is necessary to remove it from both Buccinum and Columbella; and as none of the genera in Purpuridæ seemed constituted so as to receive it, the above name (given by Swainson from the shell alone) was adopted by Dr. Gray for such of the Columbellæ as might prove to have Purpuroid opercula. It did not seem expedient to adopt the group of Messrs. Adams, till the opercula of other species had been examined; nor to draw out a more precise diagnosis, till it was known how far the peculiarities of B. cribrarium were of specific or of generic value.

613. Nitidella cribraria.

Buccinum cribrarium, *Lam. An. s. Vert.* vol. x. p. 176, no. 43.—*Quoy & Gaim. Voy. de l'Astr. Zool.* vol. ii. p. 421, pl. 30, f. 21, 22.—*Kien. Icon Conch.* p. 45, no. 44, pl. 16, f. 57.
Columbella cribraria, *Sow. Thes. Conch.* p. 129, no. 51, pl. 37, f. 112, 113.—*Desh.* in *Lam.* loc. cit.—*Gray* in *Zool. Beech. Voy.* p. 129.—*B. M. Cat. Cub. Moll.* p. 27, no. 316.—*Mke. (Conch. St. Vinc.)* in *Zeit. f. Mal.* 1853, p. 75.
(Columbella) Mitrella cribraria, *H. & A. Ad. Gen.* i. 183.
= Voluta ocelata, *Gmel.* p. 3455.
= Le Barnet, *Adans. Seneg.* p. 146, pl. 10, f. 1.
= Buccinum parvulum, *Dkr.* in *Zeit. f. Mal.* 1847, p. 64.—*Phil. Abbild.* iii. pl. 2, f. 7.
= C. mitriformis, *Brod. & King, Zool. Journ.*—*Listeri, Conch.* pl. 929, f. 24, (teste *Gray.*)
= C. guttata, *Sow. Proc. Zool. Soc.* 1832, p. 118,—*Müll. Syn. Nov. Test. Viv.* p. 88.—*C. B. Ad. Pan. Shells*, p. 89, no. 89.—(Non *Sow. Proc. Zool. Soc.* 1844, p. 50:—*Thes. Conch.* p. 181, no. 59, pl. 39, f. 124:=C. punctata, *do.* index, p. 146.)

This well marked form appears to be very widely diffused. The Pacific type is of course regarded by Prof. Adams as distinct from the Caribbæan, as it was at first by Sowerby. It

is however by no means constant in colour and markings ; nor are the Atlantic shells more so. One perfect adult specimen was found, with 12 whirls, one young with 8, and one adult partially decollated with 6 ; else all the specimens were broadly truncated, leaving only 4, in the young occasionally 3 whirls. The early whirls are glossy and colourless ; apex slightly flattened. The ground colour is either dark or very light purplish brown, with infrasutural spots distinct ; and either large or very small, regular or irregular, spots of very pale colour over the body. Colour generally darker round the periphery. Epidermis very thin, of a light greenish horn colour. Base with spiral striæ. Labrum with 9-12 teeth, of which that next the shoulder is elongate. Labium broad, smooth. The operculum is very long, and thin, large for the shell, horny, with faint ridges of growth. The perfect specimen measures *long.* ·55, *long. spir.* ·34, *lat.* ·19, *div.* 28°.
An ordinary sp. ,, ·46, ,, ·23, ,, ·22, ,, 32°.

Hab.—Java Seas, *M. Leschenault,* Lamarck.—Ascension Isl. *Quoy & Gaimard.*—Corea, *Kiener.*—Guinea, *Tams.*—Cuba, *Sagra.*—Barbadoes, *Cutting.*—Panama, under stones, very common, *Cuming.*—Taboga and Panama ; under stones not far above low water mark, not common, *C. B. Adams.*—Mazatlan ; *Col. Jewett.*—Do. rare ; *L'pool Col.*

Tablet 2304 contains a small white shell with 5 whirls, which may possibly be the young of this species. It was found in the mouth of a Trivia sanguinea.

Tablet 2305 contains the perfect adult, and 3 young sp.—2306, 5 sp. adult, decollated, varying in pattern.—2307, 1 sp. with its operculum, and 1 separate operculum.

614. NITIDELLA ———, *sp. ind.*

Tablet 2308 contains an apical and a basal fragment of a species perfectly smooth except the basal striæ, with purple in large irregular patches or zigzag lines.

Tablet 2309 contains a fragment like the last, and possibly conspecific, but crowded with the most minute radiating striulæ.

Hab.—Mazatlan ; extremely rare, off Spondylus ; *L'pool Col.*

Family BUCCINIDÆ.

Operculum thin, horny, generally subovate, regular: nucleus subcentral, or directed to the anterior outer margin.

Genus COLUMBELLA, *Lam.*

Columbus, *Montf.*—Peristera, *Rafin.*
Columbella, pars solum, *auct.*: *v.* Nitidella *et* Anachis.

615. Columbella major, *Sow.*

Proc. Zool. Soc. 1832. p. 119.—*Müll. Syn. Nov. Test. Viv.* p. 90.—*Sow. Thes. Conch.* p. 110, no. 2. pl. 36, f. 3, 4, 6.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 266 note, 274, no. 19.—*Trait. Elem.* pl. 120, f. 11, 12.—*Mke.* in *Zeit. f. Mal.* 1847, p. 182, no. 19.—*C. B. Ad. Pan. Shells*, p. 93, no. 94.
C. strombiformis, var. *Kien. Icon. Conch.* p. 4, pl. 1, f. 1, *a*.
Adol. P = C. paytalida, *(Ducl.) Kien. Icon. Conch.* p. 5, no. 3, pl. 1, f. 2.*
P = C. gibbosa, *Val.* in *Humb. Rec. Obs.* vol. ii. p. 331.—*Ducl.* in *Chénu, Ill. Conch.* pl. 5, f. 5; P6.

This fine and typical species is clothed with a very thick olive epidermis, lying in laminæ of growth; of which those above the periphery are very finely serrated by spiral lines, and those below are somewhat irregularly shaggy. The apex is often red, sometimes white. The majority of living specimens are for the most part free from incrustations. Along with other species, it varies in the number of labral teeth, and in the amount of shouldering near the suture.

The individuals of this species present remarkable differences in their opercula. In the normal state, of which many hundreds have been examined, it is intermediate between Purpura and Buccinum, resembling that of Columbella rustica as figured by *Ducl., Mon.* pl. 3, f. 10 *b*, or Iopas sertum, *H. & A. Ad. Gen.* vol. i. pl. 13, f. 4 *a*. It is thin, light horn-coloured, with an ill-defined purple-brown stain in a radiating central triangle; with coarse striæ of growth, ovate, more or less angulated at the vertex, which is generally decollated, and situated towards the base of the labrum. Sometimes the nucleus is close to the basal margin, sometimes nearer the middle; the operculum

* It is difficult to say whether this is a half-formed C. major, or a C. fuscata, as the referenceto C. rustica, *Sow. Gen.* f. 3 implies. The C. fuscata is the C. moleagris *(Ducl.)* of Kiener, who figures the true C. rustica with a finely cancellated velvety epidermis.

itself being very variable in shape, sometimes rather elongated, sometimes squarish. The muscular scar occupies the inner portion, long and narrow. A large specimen measures ·22 by ·14, and therefore can only make its egress from the adult mouth sideways. This is provided for in the narrow scar, and accounts for the frequent decollation of the apex.—In many hundred specimens however, the nucleus was found to be abnormal, generally near the middle of the outer margin, as in Buccinum undatum; but often nearly central. So common is this state that great confusion might have arisen if the opercula had been first described from only a few specimens.

The smallest adult shell measures ·82 by ·47; the largest specimen *long.* 1·3, *long. spir.* ·53, *lat.* ·84, *div.* 80°.
A slender sp. „ 1·1, „ ·48, „ ·6, „ 60°.
A broad sp. „ ·94, „ ·35, „ ·65, „ 80°.

Hab.—Isle Muerte, *Cuming.*—Seas of S. America, Deshayes.—Panama, *Col. Jewett.*—Taboga, rare, *C. B. Adams.*—Mazatlan, *Melchers, Lieut. Green.*—Do.; extremely abundant and fine; *L'pool Col.*

Tablet 2310 contains 7 sp. very young.—2311, 6 do. a stage older, aperture not contracted.—2312, 5 do. aperture contracting.—2313, 4 do. labral ridge just appearing.—2314, 5 do. teeth commencing.—2315, 5 do. mouth almost complete.

Tablet 2316 contains 6 sp. adult, broad form.—2317, 6 do. normal state.—2318, 6 do. more elevated.—2319, 6 do. acuminate.—2320, 3 do. with opercula in situ.

Tablet 2321 contains 3 sp. var. minor, broad.—2322, 4 do. normal.—2323, 3 do. acuminate.

Tablet 2324 contains 3 sp. epidermis removed.—2325, 3 sp. shoulder pinched.—2326, 4 sp. incrusted with Bryozoa, &c.—2327, 3 sp. mended after fracture.

Tablet 2328 contains 12 opercula, normal.—2329, 6 do. incrusted with Bryozoa, Annelids, &c.—2330, 6 sp. nucleus near the center of the outer margin.—2331, 6 do. nucleus nearer the center of the operculum.—2332, 6 do. nucleus almost central.—2333, 5 sp. of strange shapes through fracture.—2334, 3 do. with layers composed of different elements.

616. COLUMBELLA STROMBIFORMIS, *Lam.*

An. s. Vert. ed. *Desh.* vol. x. p. 266, no. 1.—*Sow. Gen.* f. 1:—*Thes. Conch.* p. 110, no. 1. pl. 36, f. 1, 2.—*Val.* in *Rec. Obs.*

vol. ii. p. 330.—*Desh.* in *Enc. Meth.* vers. ii. p. 251, no. 1.—*Blainv. Mal.* i. 29, f. 3 (teste *Desh.*: f. 23, test. *C. B. Ad.*)—*Rve. Conch. Syst.* vol. 2, p. 218, pl. 257, f. 1 (malé, *C. B. Ad.*)—*Ducl.* in *Chénu, Ill. Conch.* pl. 5, f. 7, 8.—*Kien. Icon. Conch.* p. 3, pl. 1, f. 1. (1, *a* excl.)—*B. M. Cat. D'Orb. Moll.* p. 39, no. 342.—*Mke.* in *Zeit. f. Mal.* 1847, p. 182, no. 18.—*C. B. Ad. Pan. Shells*, p. 98, no. 102.

Buccinum strombiforme, *Wood, Ind. Test. Suppl.* pl. 4, f. 18.

Var. ?=Columbella gibbosa, *Val. Rec. Obs.* vol. ii. p. 331.—*Chén. Ill. Conch.* pl. 5, f. 5, 6.*

Although Sowerby states that C. major is easily distinguished from this species, and says truly of picked specimens, yet C. major is so variable in its shape and size that it is not impossible that this may be a permanent variety of that species as (*v. v.*) Kiener supposes. At the same time, as Deshayes remarks, the differences, though slight, acquire importance by their constancy. The present form is somewhat rounder in the spire; with the pattern developing streaks instead of spots; having the mouth more or less tinged with orange; and also (what appears to be the most trustworthy character) with the radiating ridges in the epidermis, finely serrated by spiral lines all over, and not at the upper portion only, as in C. major. The size is more constant than in that species, adults being never found either so large or so small. The opercula appear exactly like those of C. major, both in the normal and abnormal conditions. The frequency of the latter, while the shell is quite perfect, shews that the animals are peculiarly liable (in both of the species) to pedal injuries. A broad specimen measures *long.* ·95, *long. spir.* ·28, *lat.* ·62, *div.* 80°.

A slender sp. „ 1·01, „ ·37, „ ·62, „ 70°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Isle of Muerte, *Cuming.*—Payta, Peru, *Fontaine*, D'Orbigny.—Taboga, 1 specimen, *C. B. Adams.*—Mazatlan, *Melchers.*—Do.; not uncommon among C. major; *L'pool Col.*

Tablet 2335 contains 3 sp. young.—2336, 5 sp. broad form.—2337, 6 do. normal state.—2338, 2 do. acuminate.—2339, 4 sp. approaching C. major, yellow colour scarcely developed.—2340, 4 sp. with opercula in situ, normal and abnormal, also loose opercula.—2341, 2 sp. shewing colour under epidermis.

* As this shell is figured with a yellow mouth and light spots on the back, it is difficult to say whether it is intended for a variety of C. strombiformis or of C. major.

617. COLUMBELLA FUSCATA, *Sow.*

Proc. Zool. Soc. 1832, p. 117.—*Sow. Thes. Conch.* p. 114, no. 11, pl. 36, f. 21, 25.—*Müll. Syn. Nov. Test. Viv.* p. 88.—*Desh.* in *Lam. An. s. Vert.* x. 276, no. 22.—*Mke.* in *Zeit. f. Mal.* 1850, p. 184, no. 61.—*C. B. Ad. Pan. Shells*, p. 87, no. 86.

=C. melcagris, *Kien. Icon. Conch.* p. 10, no. 7, pl. 3, f. 3.—*Ducl.* in *Chénu, Ill. Conch.* pl. 4, f. 15, 16; ? + pl. 16, f. 13, 14, (1840.)—*B. M. Cat. D'Orb. Moll.* p. 39, no. 344.—*H. & A. Ad. Gen.* i. 182.

=Columbella rustica, pars, *Sow. Gen.* f. 3.—Comp. *Val. Rec. Obs.* vol. ii. p. 329.

Extremely like the Mediterranean C. rustica; from which it is known by the epidermis, which in C. rustica is hairy, in C. fuscata thin, and nearly smooth. Deshayes adds a number of minute particulars, which seem to have been described from a single specimen. It would be hard to distinguish small, dead specimens, if mixed together. In general however it is much larger, with colour and pattern resembling C. major. It does not vary much in outline. The opercula closely resemble those of C. major; but are smaller, and generally broader in proportion, with the apex nearer the center of the outer margin. The muscular scar is broader and the dark stain more developed. The ovate abnormal states seem as common as in C. major. A normal operculum measures ·15 by ·1. The smallest adult shell measures ·67 by ·37; a slender sp. measures *long.* 1·04, *long. spir.* ·35, *lat.* ·53, *div.* 60°.
A broad sp. " ,, ·85, ,, ·24, ,, ·54, ,, 80°.

Hab.—Common, under stones, at Panama, St. Elena and Monte Christi; *Cuming.*—Payta, Peru, *D'Orbigny.*—Taboga; under stones a little above low water mark, small and very rare; *C. B. Adams.*—Acapulco, Lesson.—San Blas, *Kiener.*—Mazatlan; common and very fine; *L'pool Col.*

Tablet 2342 contains 5 sp. young, in different stages of growth.—2343, 7 sp. broad form.—2344, 7 sp. ordinary state.—2345, 7 do. rather narrower.—2346, 7 sp. slender growth.

Specimens shewing colour. Tablet 2347 contains 3 sp. uniform olive epidermis.—2348, 3 do. with one dark band.—2349, 3 do. with small spots.—2350, 3 do. spots developed.—2351, 2 do. orange olive.—2352, 2 sp. epidermis removed.

Tablet 2353 contains 3 sp. with Bryozoa.—2354, 1 do. with egg cases.—2355, 3 sp. mended after fracture.—2356, 1 sp. with operculum in situ.

Tablet 2357 contains 6 normal opercula.—2358, 10 abnormal do. nucleus more or less central.—2359, 2 do. irregularly repaired after fracture.

618. ? COLUMBELLA CERVINETTA, *n. s.*

? C. t. parvâ, plerumque lævi, spirâ subelevatâ, marginibus excurvatis: colore flavido-fusco, fasciis spiralibus iii. *purpureo-fuscis, fasciâ juxta suturam aurantiâ; maculis rotundatis albis, nisi suturam versus, omnino conspersâ; anfr.* iii. *nucleosis lævibus, compactis; dein* ii. *radiatim costatis, costis planatis, parum expressis; dein* iii., *nisi lirulis circa basin spiralibus, omnino lævibus; anfr. planatis, suturâ haud impressâ: aperturâ subelongatâ, labro acuto, vix denticulato; labio conspicuo, lævi, parum extante.*

Only one specimen was found of this very beautifully painted species. In the pattern it somewhat resembles Nitidella cribraria; but the spire is distinct. *Long.* ·27, *long. spir.* ·14, *lat.* ·12, *div.* 40°.

Hab.—Mazatlan; 1 fresh sp.; *L'pool Col.*

Tablet 2360 contains the specimen.

618, *b.* ? COLUMBELLA CERVINETTA, *var.* OBSOLETA.

? C. cervinetta, t. minore, anfr. lævibus ii.; *albidâ, rufocastaneo obscure fasciatâ, maculis albis subobsoletis; labro dentato.*

One young and one adult sp. were found, differing as above; but the similarity of the upper whirls, general pattern and habit, seem to mark them as conspecific. The adult measures ·19 by ·08.

Hab.—Mazatlan; 2 sp. off Spondylus; *L'pool Col.*

Tablet 2361 contains the adult.

GENUS ? METULA, *H. & A. Ad.*

Gen. vol. i. p. 84.—Shell resembling Daphnella. Buccinum (pars) *auct.*

619. ? METULA ———, *n. s.* (*a*)

Tablet 2362 contains a young shell, with 4 smooth nuclear and more than two normal whirls; elongated, white, very

finely cancellated: also an extremely young shell, of similar sculpture, which may possibly be conspecific.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

620. ? METULA ———, *n. s.* (*b*)

Tablet 2363 contains a young shell with 3 smooth, nuclear, and two normal whirls; also a fragment of an older one; less acuminate than the last species, with stronger sculpture, more swollen whirls, and of a brownish colour.

Hab.—Mazatlan; portions of 7 sp. off Spondylus; *L'pool Col.*

621. ? METULA ———, *sp. ind.* (*c*)

Tablet 2364 contains a very young shell and fragments, belonging to a species with strong undulating ribs like Pisania, and well marked spiral striæ.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

622. ? METULA ———, *sp. ind.* (*d.*)

Tablet 2365 contains a minute shell, of Metuloid shape and sculpture, with four nuclear whirls remarkable for their closely and minutely shagreened surface.

Hab.—Mazatlan; 1 sp. off Spondylus: *L'pool Col.*

SUB-FAMILY NASSINÆ.

GENUS NASSA, *Lam.*

Only one species in this genus was found in abundance: another was not uncommon; the rest were extremely rare or only fragmentary.

623. NASSA LUTEOSTOMA, *Brod. & Sow.*

Zool. Journ. vol. iv. p. 376, 1829.—*Rve. Elem. Conch.* pl. 3. f. 11.—*Mke.* in *Zeit. f. Mal.* 1850, p. 179, no. 44.—*C. B. Ad. Pan. Shells*, p. 62, no. 48.

Buccinum luteostoma, *Kien. Icon. Conch.* p. 110, pl. 30, f. 1.—*Eyd. & Soul. Voy. Bonite*, pl. 41, f. 5-7 :—*B. M. Cat.* p. 25, no. 203.

Nassa xanthostoma, *Gray* in *Zool. Beech. Voy.* 1839, p. 127, pl. 36, f. 3 :—*Fig. Moll. An.* pl. 85, *a*, f. 5.

(Nassa) Phrontis xanthostoma, *H. & A. Ad. Gen.* i. 118.

This abundant shell is sometimes of a nearly uniform brown; sometimes striped with light; sometimes of a uniform yellowish brown. The yellow colour of the characteristic broad flat labium varies in intensity, being sometimes very slight. The spire varies somewhat in amount of acumination. The operculum is irregularly triangular, with two rounded sides, sharply serrated; the apex being lateral, and turned against the anterior wave in the labrum; the third side, being convex and smooth, against the labial portion. The vertical angle varies, and the serrations are more or less close, (sometimes as many as 15,) obsolete towards the apex. A large number of opercula were found more or less abnormal; the apex being more or less internal, as in Buccinum, with the serrations either absent, or very few in number. The muscular scar occupies the basal portion. The smallest of the adult specimens measures *long.* ·6, *long. spir.* ·2, *lat.* ·43, *div.* 55°.

An acuminated sp.	„	·88,	„	·4,	„	·56, „ 50°.
An ordinary sp.	„	·87,	„	·38,	„	·62, „ 60°.

Hab.—Real Llejos and Acapulco, *Lesson* in *Rev. Zool.* Aug. 1842.—[Senegal, *Kiener*, ? err.—Australia, *Metcalf* in *B. M.* err.]—Panama; 330 sp. on sand, usually not far below high water mark, in places where water is running during the recess of the tide; also in similar places not far above low water mark; *C. B. Adams.*—Mazatlan; extremely abundant; *L'pool & Havre Coll.*

Tablet 2366 contains 5 sp. young.—2367, 5 do. lip forming.—2368, 5 do. nearly mature.—2369, 5 sp. lip light coloured.—2370, 7 do. normal state.—2371, 3 do. lip dark.—2372, 3 sp. spire acuminated.—2373, 5 sp. shewing colour of back.—2374, 5 do. after acid treatment.—2375, 4 sp. mended after fracture.—2376, 3 sp. dwarf variety.—2377, 2 sp. with opercula in situ.—2378, 12 normal opercula.—2379, 5 do. abnormal, irregular.—2380, 4 do. ovate, or with one prong.—2381, 3 do. with two or three prongs.—2382, 4 do. with three or four prongs.—2383, 3 do. with four or five prongs on each side.

624. NASSA TEGULA, *Rve.*

Conch. Ic. pl. 15, sp. 98.

Comp. Buccinum tiarula,* *Kien. Icon. Conch.* p. 111, pl. 30, f. 4.—*Rve. Conch. Ic.* sp. 92.=(Nassa) Phrontis t. *H. & A. Ad. Gen.* i. 118.

This shell looks like a very small N. luteostoma, with a white lip. It is of a prevailing slate colour, with a light band round the periphery, and a darker tint above. Sometimes the whole takes an olivaceous tinge. The labrum is more or less strongly lirate internally. The spiral striæ are distant, and generally very faint; but sometimes they are strong enough to make the ribs subnodulous. The last two ribs behind the varix degenerate into tubercles. The operculum is the exact anologue of that of N. luteostoma, both normally, and in its frequent abnormal changes. The smallest of the adult specimens measures *long.* ·42, *long. spir.* ·17, *lat.* ·27, *div.* 60°.

An acuminated sp.	,,	·6,	,,	·24,	,,	·38,	,, 50°.
A broad sp.	,,	·53,	,,	·2,	,,	·4,	,, 65°.

Hab.—Mazatlan; not common; *L'pool Col.*

Tablet 2384 contains 7 sp., in different stages of growth.—2385, 7 sp. adult, normal.—2386, 2 do. broad.—2387, 2 do. acuminated.—2388, 5 do. small variety (two with opercula in situ.)—2389, 6 sp. with opercula in situ, normal and abnormal; two of the latter are very small in proportion.—2390, 1 normal and 2 abnormal opercula; sides of the latter with one or two prongs.—2391, 2 sp. mended after fracture.—2392, 5 sp. shewing development of spiral striæ, nearly smooth to nodulous.

624, *b.* NASSA TEGULA, *var.* NODULIFERA, *Phil.*

Nassa nodulifera, *Phil.* in *Mus. Cum.*:=(Nassa) Phontis n. *H. & A. Ad. Gen.* i. 118.—[Non N. nodifera, *Pow.* in *Proc. Zool. Soc.* 1835, p. 95. Galapagos and Panama, *Cuming.* =(Nassa) Uzita n. *H. & A. Ad. Gen.* i. 120.]

N. t. "*N. tegulæ*" *simillima sed costis ultimis haud obsoletis; striis spiralibus intensioribus; colore supra fascid pallido, rubro-fusco maculato.*

The shells in the last tablet approach this so closely that it is more than probable that the species are identical; never-

* The specimens in the B. M. Col. marked B. tiarula, *Kien.* were received from Mr. Powis as from "South Seas" and "Africa." The habitat assigned by Reeve (without authority) to B. tiarula, is Madagascar. The two species are regarded by Dr. Baird as identical: they are here kept provisionally separate.

theless the points of difference above indicated being constant, it did not seem allowable to unite them completely. *Long.* ·63, *long. spir.* ·28, *lat.* ·4, *div.* 50°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2393 contains a sp. kindly presented by J. W. Whitehead, Esq. of Liverpool.

625. NASSA (? PAGODUS, *var.*) ACUTA.

N. t. pagodiformi, albidâ, rubrofusco tinctâ, intus violascente; anfr. nucleosis iii. *lævibus; dein anfr.* vi. *normalibus, valde tumentibus, suturâ parum excavatâ, à costis undulatâ; costis radiantibus circiter* ix. *haud latis, haud acutis, colore intensiore, interstitiis latis; costis ultimis antice subobsoletis; lirulis spiralibus crebris, extantibus, costis superantibus, supra costis subtuberculosis; aperturâ subquadratâ, antice latâ; labro et labio acuto, extantibus, haud reflexis; labro antice sinuato, ad dorsum varicoso, intus tenue lirato, lirâ ultimâ juxta canalem extante; labio lirâ parietali conspicuâ, plicâ juxta canalem valde extante, alterâ subobsoletâ; canali valde intorto, conspicuo; operculo serrato.*

Comp. Triton pagodus, *Rve. Conch. Ic.* pl. 20, sp. 97 :=Nassa p. *C. B. Ad. Pan. Shells*, p. 63, no. 50.

Comp. Buccinum decussatum, *Kien. Icon. Conch.* p. 109, no. 106, pl. 30, f. 3 :=(Nassa) Hima decussata, *H. & A. Ad. Gen.* i. 121.

The very beautiful Mazatlan shells were at first identified with an E. Indian species in the Cumingian collection, which may be the true N. polygonata of *Lam.* This however differed from the species as figured by *Kien.*; and, there being no W. Coast shell among Mr. Cuming's Nassæ at all resembling it, the N. acuta was described as new. But the Triton pagodus has evidently so much in common, that a collation of types (at present impossible) may prove them identical. If so, the error must be attributed to the unfortunate location of this very decided Nassid among the Tritons. Kiener's species, assigned by him to Africa, is identified with the Pacific shell by Prof. Adams: it may however be an analogous species, as in the case of N. tiarula and N. tegula. A dwarf adult, possessing the ordinary number of whirls, and a normally-sized nucleus, measures ·53 by ·36; the largest sp. measures *long.* ·83, *long. spir.* ·44, *lat.* ·6, *div.* 60°.

Hab.—Mazatlan; 3 sp. and fragments; *L'pool Col.*

Tablet 2394 contains the middle sized sp. with its operculum in situ.

626. NASSA ———, *sp. ind. (a)*

Tablet 2395 contains fragments of a species resembling Nassa acuta, with less defined ribs, and undulating interspaces.
Hab.—Mazatlan; off Spondylus; *L'pool Col.*

627. NASSA ———, *sp. ind. (b.)*

Tablet 2396 contains a young shell, white, resembling N. acuta, but with the whirls less inflated.
Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

628. NASSA ———, *sp. ind. (c.)*

Tablet 2397 contains fragments of a species with rather flattened whirls; the ribs crossed by raised, sharply defined lirulæ, with deep interstices.
Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

629. NASSA ———, *sp. ind. (d.)*

Tablet 2398 contains a young shell and a fragment of a globose species; nucleus tumid, large, of nearly four whirls; normal whirls with sharp ribs, distant, crossed by rather close spiral striæ.
Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

630. NASSA ———, *sp. ind. (e.)*

Tablet 2399 contains a young sp. (imperfect) of a species resembling the last, but less swollen, brownish, with the ribs tumid.
Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

631. NASSA ?GEMMULOSA, *C. B. Ad.*

Pan. Shells, pp. 61, 305, no. 46.
(Nassa) Niotha gemmulosa, *H. & A. Ad. Gen.* i. 117.

Tablet 2400 contains 2 young shells and a fragment which probably belong to this species. The first 3 whirls are smooth and rather globose; then fine sharp ribs appear, which soon become fenestrated by spiral lines which increase in number, and finally develop granules at the intersections.

Hab.—Panama, 1 sp. *C. B. Adams.*—Mazatlan; portions of 5 specimens, off Spondylus; *L'pool Col.*

632. NASSA ?VERSICOLOR, *C. B. Ad.*

Pan. Shells, pp. 66, 305, no. 55.—*Rve. Conch. Ic.* pl. 17, f. 110.
(Nassa) Uzita versicolor, *H. & A. Ad. Gen.* i. 120.

Tablet 2401 contains fragments which may belong to this species.

Hab.—Taboga, common, *C. B. Adams.*—?Mazatlan; extremely rare, fragments off Spondylus; *L'pool Col.*

633. NASSA CREBRISTRIATA, *n. s.*

N. t. acuminatâ, flavido-fuscâ, solidiore; anfr. normalibus vi. *parum rotundatis, suturâ distinctâ; costis circiter* x. *acutis, distantibus, sparsim varicosis, aperturam versus haud obsoletis; striulis spiralibus creberrimis, exillimis ornatâ; aperturâ subrotundatâ; labro varicoso, intus crebre lirulato, juxta canalem lirâ extante; labio haud reflexo, parum extante; tuberculo parietali parvo; plicâ acutâ canalem recurvatum valde extantem definiente.*

The only specimen found, covered with Bryozoa in the upper whirls, has the aspect of N. incrassata, from which and cognate species it differs in the extreme fineness of the spiral sculpture. *Long.* ·54, *long. spir.* ·32, *lat.* ·3, *div.* 37°.

Hab.—Mazatlan; 1 fresh sp. *L'pool Col.*

Tablet 2402 contains the specimen.

634. NASSA ———, *sp. ind. (f.)*

Tablet 2403 contains a small, imperfect specimen resembling N. crebristriata; but red, with the spire less elevated, and the ribs broad and blunt.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

635. Nassa ———, *sp. ind. (g.)*

Tablet 2404 contains a young shell and fragment (perhaps not conspecific) with flattened whirls, flattened ribs, and spiral decussations which do not cross the ribs.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

636. Nassa ———, *sp. ind. (h.)*

Tablet 2405 contains 2 fragments (perhaps not conspecific), with 3 smooth nuclear whirls; normal whirls flattened, crossed by fine spiral striæ.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

637. Nassa ———, *sp. ind. (i.)*

Tablet 2406 contains a fragment of a very elevated species, white, with the broad concave interstices of the sharp ribs spirally striated.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 2407 contains an egg case, probably of a Nassa, off Spondylus.—*L'pool Col.*

Family PYRULIDÆ.

Genus PYRULA, *Lam.*

Pyrula, *Lam.* 1799, pars:—*Phil. Handb. Conch.* p. 141.
Melongena, *Schum.* 1817.
Cassidulus *(Humph.) Gray, Proc. Zool. Soc.* 1847, p. 135, no. 21:—*H. & A. Ad. Gen.* vol. i. p. 81.
Galeodes, *Bolten.*
Semicassis, *Martin,* (teste *Desh.)*
Cyrtulus, sp. *Hinds.*

638. Pyrula patula, *Brod & Sow.*

Zool. Journ. vol. iv. p. 377.—*Zool. Beech. Voy.* p. 115, pl. 34, f. 10, jun., pl. 35, f. 3, jun., pl. 35, f. 1. adult.—*Kien. Icon. Conch.* p. 14, no. 9, pl. 2, f. 1, 2.—*Desh.* in *Lam. An. s. Vert.*

vol. ix. p. 522, no. 31.—*Val.* in *Humb. Rec. Obs.* vol. ii. p. 291.—*Rve. Conch. Ic.* pl. 9, f. 20.—*Mke.* in *Zeit. f. Mal.* 1851, p. 18, no. 84.—*C. B. Ad. Pan. Shells*, p. 127, no. 145.
Cyrtulus patulus, *Hinds, Voy. Sulph. Moll.* p. 13.
Cassidulus patulus, *H. & A. Ad. Gen.* i. 81.
=P. melongena, var. *Sow. Tank. Cat.* p. 92, no. 1611.

It is almost impossible to give characters by which all the specimens of this species can be distinguished from all the specimens of the W. Indian P. melongena. Deshayes says that they are best distinguished in the young state: yet one of the young specimens marked by D'Orbigny "P. melongena" in the Sagra Col. B. M. would certainly be called P. patula if the locality were unknown, as it agrees with this species in form, markings, and even in the remarkable epidermis: while another specimen in the same collection is of the true melongena type. ?It can scarcely be supposed that Sagra had obtained a West-coast shell. At the same time the general habit of the two species is sufficiently distinct, when taken in conjunction with the difference of ocean, to warrant their separation, at least till their animals have been more carefully compared.*

P. patula is generally distinguished (as compared with P. melongena,) by its much lighter, and somewhat slenderer growth. Of two shells, of almost exactly the same length, namely 5·3 inches, the breadth of P. melongena (without the spines) is 4·4, of P. patula only 3·9: also P. melongena weighs 16· ounces, while the specimen of P. patula only reaches 5·5. Moreover P. patula in the adult is scarcely striated spirally or denticulated at the outer lip, (as in P. melongena,) except near the base. It has never more than one row of tubercles, on the shoulder, and these are often evanescent. The colour is a deeper and richer brown; generally with but few, or even without, spiral lines of light. Parietal infra-sutural callosity very slight. Posterior canal long, deep and narrow, (in the largest sp. *long.* 1·53, *lat.* ·36, *alt.* ·9,) more reflected over the spire, and producing a very concave surface outside. Labrum sharp. Labium thin, less expanded. The elevation of the spire is a very variable character. Epidermis extremely coarse and thick, in parallel shreds of growth, not unlike the husk of a cocoa-nut, but dull dark olive. The whole of the specimens

* As specimens of the melongena type frequently occur in E. Indian collections, and are so quoted by Reeve, ? are we to suppose that this species occurs in both oceans, or that a third species exists in the Indian Seas.

in the L'pool Col. (except a very few which I had secured before the fatal act) were, in spite of my earnest entreaties, subjected to the acid decorticating process for drawing-room purposes. I saw a large box of specimens, in the yard of a London dealer, rapidly approaching the same result by exposure to the weather. Operculum long, thin, narrow, unguiculate, nearly straight, rather concave externally: ridges of growth shewing through on the large inner attachment.*

The young shell has the spire more or less exserted, stoutly nodulous, with the whole surface finely spirally striated: posterior canal rudimentary; anterior do. very long. The largest sp. measures *long.* 8·7, *long. spir.* ·2, *lat.* 6·8, *div.* 140°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Bay of Caraccas; on mud banks; *Cuming.*—Bay of Panama, *C. B. Adams.*—Mazatlan; fine and abundant; *L'pool & Havre Coll.*

Tablet 2408 contains 4 sp. very young: the smallest is 1·7 by ·9; another retains its operculum.—2409, 3 sp. adolescent; the first quite smooth, blackish brown, with one broad white peripheral band, and about 12 narrow lines near the base; the second brownish black, with extremely numerous very fine white lines in the middle, and a few rudimentary shoulder knobs; the third well tuberculated, very light brown, with white band and lines, dark at the back of the canal.—2410, 2 sp. adult: the first begins banded, without tubercles, and ends of a uniform blackish brown, tuberculated; the other has two very narrow white bands, and has commenced tuberculating after a serious accident to its posterior canal.—2411, the largest sp. with its epidermis, partially covered with Bryozoa.

Family MURICIDÆ.

Genus FUSUS, *Brug.*

Enc. Meth. p. xv, no. 45.—*Phil. Handb. Conch.* p. 139.—*H. & A. Ad. Gen.* vol. i. p. 78.—[Non Fusus, *(Humph.) Gray*, in *Proc. Zool. Soc.* 1847, p. 132.]
Colus, *(Humph.) Gray*, in *Proc. Zool. Soc.* 1847, p. 135.

639. Fusus pallidus, *Brod. & Sow.*

Zool. Journ. vol. iv. p. 378.—*Zool. Beech. Voy.* p. 117, pl. 36, f. 14.
= Pyrula lignaria, *Rve. Conch. Ic.* pl. 9, sp. 12, f. 13, *a b*, teste *Hanl.*

* None were found of the large shells: *v.* Fasciolaria princeps, p. 459, *note.*

Var. = Fusus turbinelloides, *Rve. Conch. Ic.* pl. 15, sp. 56.
Fusus lignarius, + F. turbinelloides, + Neptunea pallida, *H. & A. Ad. Gen.* i. 78, 79, 80.
Comp. Pyrula lactea, *Rve. Conch. Ic.* pl. 3, sp. 8.
Comp. P. anomala, *Rve. Conch. Ic.* pl. 3, sp. 9, = Neptunea anceps, *H. & A. Ad. Gen.* i. 80.

Dr. Gould having sent a fine specimen of this shell with the operculum and animal dried, I requested Dr. Gray to examine them. His report is as follows :—"It has the elongated cylindrical proboscis of Cassidulæ and Muricidæ, and three series of teeth. The central tooth is arched, with three elongate acute processes in front. The lateral teeth versatile, with a larger apical and smaller hamate tooth at its base, the latter having a small hamate process on the outer side of its base. Plates of insertion in denticulated lobes; integument tessellated with smooth scales.

"Unfortunately the animal had been injured about the head, so that I could not observe the form of that part, or the position of the tentacles which is the essential character of the two families above named, and the teeth are not distinctive; but considering all the characters, I think that it has more affinities with Colus (Fusus) in Muricidæ, than with Pyrula in Cassidulidæ. The operculum is ovate subtrigonal; apex rather worn; the size of the mouth of the shell."

The shell is characterized by its depressed Turbinelloid growth, angulated whirls, and swollen rounded ribs, crossed by spiral striæ. Labrum crenated, lirated within. Labium conspicuous in the adult. Shell white, with a beautiful velvety olivaceous epidermis. Young shell with canal bent, and a callous Fasciolaroid fold on the columella. According to *Brod. & Sow.*, a fossil from the Calcaire Grossiere of Paris presents no observable marks of difference. *Long.* 1·54, *long. spir.* ·62, *lat.* ·96, *div.* 70°.

Hab.— Mazatlan, *Belcher.*—Callao, Peru, *Hinds*, B. M.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2412 contains the largest and the smallest specimens.

640. Fusus tumens, *n. s.*

F. t. parvâ, spirâ acutâ, marginibus rectis; anfr. ii. *nucleosis,* v. *normalibus, valde tumentibus, suturâ impressâ; costis radiantibus* viii. *valde tumentibus, rotundatis, ad basin obsoletis,*

interstitiis concavis ; lirulis spiralibus prominentibus, costis superantibus ; canali aperturæ longitudine subæquante.

Only one dead specimen was found of this pretty little species, which somewhat resembles in extreme miniature the F. Dupetit-Thouarsii, quoted from the Galapagos, *Cuming*, and, (though on the authority of Kiener only,) from Mazatlan. *Long.* ·16, *long. spir.* ·08, *lat.* ·07, *div.* 40°.

Hab.—Mazatlan; 1 sp. off Chama; *L'pool Col.*

Tablet 2413 contains the specimen.

641. Fusus apertus *n. s.*

F. t. subelongatâ, albidâ, rufo-fusco irregulariter fasciatâ ; anfr. nucleosis ii. *tumentibus, irregŭlaribus ; normalibus* iii. *+...haud valde tumentibus, suturâ impressâ ; costis radiantibus circiter* xii. *rotundatis, haud valde prominentibus, basin versus obsoletis ; interstitiis parvis ; lirulis spiralibus, costis superantibus ; canali aperto, parum recurvato, longitudine aperturæ curtiore.*

The six specimens found of this species were either young or fragmentary; the size of the nucleus betokening a much larger shell. It differs from F. tumens in the spire being less elevated, the whirls and ribs (which are more numerous) less swollen, and the canal shorter and open. A perfect young sp., with 5 whirls, measures *long.* ·1, *long. spir.* ·047, *lat.* ·055, *div.* 40°.

Hab.—Mazatlan; extremely rare, off Spondylus and Chama; *L'pool Col.*

Tablet 2414 contains 2 young sp. and a fragment of one older.

642. ?Fusus ———, *sp. ind. (a.)*

Tablet 2415 contains a minute shell, with 2 large irregular nuclear whirls, and a normal whirl, finely cancellated, white, of a subconoid shape.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

643. ?Fusus ———, *sp. ind. (b.)*

Tablet 2416 contains a minute transparent shell of 3 whirls, of which the first two are swollen and irregular, the third sub-

carinated: The shape of this is like Anachis, &c.; but in all the Columbelloid shells examined, the nucleus is regular.

Hab.—Mazatlan; 1 young sp. off Spondylus; *L'pool Col.*

Genus COMINELLA, *Gray.*

H. & A. Ad. Gen. vol. i. p. 110. Shell Buccinoid. Operculum Muricoid.

644. ?Cominella ————, *sp. ind.*

Tablet 2417 contains a small smooth yellow shell, of regular form. The first four whirls have a different shade of colour and may be nuclear.

Hab.—Mazatlan; 1 young sp. off Spondylus; *L'pool Col.*

Genus ANACHIS, *H. & A. Ad.*

Gen. vol. i. p. 184: (as Subgenus of Columbella.)

Testa Columbellæ similis, spirâ elevatâ, anfractibus liratis; aperturâ subquadratâ; labro intus dentato, labio crenato. Operculo elongato, unguiformi, nucleo terminali.

Columbella, pars, *auct.*

These shells, which form a very natural group of the old genus Columbella, are distinguished essentially by the operculum, which has closer analogies with Pisania. The operculum of Columbella fulgurans, which is a smooth species with a twisted mouth, is figured by Messrs. Adams, pl. 19, f. 7 *b*; *c*, as resembling that of Anachis. The opercula of Columbelloid shells have hitherto received so little attention that Dr. Gould in his great work on the U. S. Expl. Exp. Shells, p. 270, states that they have none.

645. Anachis scalarina, *Sow.*

Columbella scalarina, *Sow.* in *Proc. Zool. Soc.* 1832, p. 116:—*Thes. Conch.* p. 130, no. 55, pl. 39, f. 118.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 288, no. 40.—*Chénu Conch. Ill.* pl. 25, f. 34, (malé.)

(Columbella) Anachis scalarina, *H. & A. Ad. Gen.* i. 184.

Two young shells and one adult specimen are referred to this species by Mr. Cuming. Being in perfect condition, the

character of the epidermis may be relied on, which is very thin, rather deciduous, with a very few fine ridges of growth. It is further distinguished from all the varieties of A. costellata, by its large size, very regular, somewhat inflated growth, sharp continued ribs cancellated over the whole surface, and strong teeth on the upper portion of the outer lip. Colour principally brown with a white band below the suture. The young shell has a distinct, somewhat bent canal, and is exquisitely beautiful. *Long.* ·88, *long. spir.* ·47, *lat.* ·4, *div.* 40°.

Hab.—Panama & Chiriqui, under stones, *Cuming.*—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2418 contains a young and the adult specimen.

646. ANACHIS COSTELLATA, *Brod. & Sow.*

Columbella costellata, *Brod. & Sow.* in *Zool. Journ.* vol. iv. p. 376, (1829.)—*Gray* in *Zool. Beech. Voy.* p. 129, pl. 36, f. 9.—*Sow.* in *Proc. Zool. Soc.* 1832, p. 118.—*Müll. Syn. Nov. Test. Viv.* p. 88.—*Ducl.* in *Chénu, Ill. Conch.* pl. 25, f. 11, 12.—*Sow. Thes. Conch.* p. 137, no. 79, pl. 39, f. 147.—*C. B. Ad. Pan. Shells,* p. 84, no. 81.

(Columbella) Anachis costellata, *H. & A. Ad. Gen.* i. 184.

Although early published, this species is not included by Deshayes in the An. s. Vert.: by which the student loses the very accurate diagnosis which would have been given to this as to the other species. The Mazatlan shells divide themselves with tolerable accuracy into two sets, the one characterized by a coarse lamellar epidermis, the other by one very thin, smooth, or rarely scaly, closely adherent, and displaying the rich chesnut colour of the shell. The latter are those which agree with the figure in Zool. Beech. Voy. They differ from C. scalarina in their very much smaller size, chesnut markings, flattened whirls, and the adherence of the epidermis. Should the epidermal differences prove constant, they may be the best characters to recognize the species, as the features recorded by Sowerby are subject to great variation. The decussation of the interspaces is generally only seen on the spire in the young shell; the spiral striæ at the base are sufficiently conspicuous.

A narrow sp. measures *long.* ·52, *long. spir.* ·28, *lat.* ·22, *div.* 34°.
A broad sp. „ „ ·65, „ ·34, „ ·3, „ 40°.

Hab.—Panama, 1 sp. 16 fm., *Cuming.*—Panama and coast of Africa [?] Gray, in Beechey's Voyage.—Panama; under

stones near low water mark, rare; *C. B. Adams.*—Mazatlan; very rare; *L'pool Col.*

Tablet 2419 contains 3 sp. narrow.—2420, 3 do. broader.—2421, 2 sp. one with operculum, the other after the acid process.

646, *(b.)* ANACHIS (?COSTELLATA, *var.*) PACHYDERMA.

A. t. "*A. costellatæ*" *simillimâ, sed plerumque latiore, fusco-purpureâ, albido fasciatâ et in tuberculis maculatâ; epidermide solidâ, rugis incrementi confertis ornatâ, haud valde adhærente; operculo elongato, subarcuato, scabriusculo, apice terminali sæpe decollato.*

Comp. Columbella varia, *Sow.* in *Proc. Zool. Soc.* 1832, p. 116.—*Müll. Syn. Nov. Test. Viv.* p. 86.—*Sow. Thes. Conch.* p. 130, no. 54, pl. 39, f. 116-7.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 282, no. 31.—*C. B. Ad. Pan. Shells,* p. 100, no. 105.—=(Columbella) Anachis varia, *H. & A. Ad. Gen.* i. 184.

It might be thought that the true A. costellata is this shell with the outer part of the epidermis rubbed off; but in this form, when the epidermis comes off, it leaves the dark purplish brown surface of the shell itself, not the close thin skin of the chesnut-stained A. costellata. These shells were regarded by an eminent authority as one of the many varieties of A. varia.* They appear however much more nearly related to A. costellata, from which the operculum does not perceptibly differ. This shell, like A. costellata, is more or less turrited, sometimes obese; with ribs more or less numerous, more or less waved, more or less produced towards the base; interstices more or less cancellated by spiral striæ. The flattening of the middle of the lip often gives the ribs the appearance of being slightly tubercular both above and below. Colour purple brown, more or less dark and spotted or banded with white. The best character is the epidermis, which is thick, lying in transverse layers as in C. major, but coarser in proportion, dark green. A broad sp. measures *long.* ·66, *long. spir.* ·34, *lat.* ·32, *div.* 40°.

Hab.—Mazatlan; rare; *L'pool Col.*

Tablet 2422 contains 6 sp. in different stages.—2423, 1 sp. with operculum in situ, and one separate operculum.

* The Col. terpsichore of Menke may belong to this species, though his diagnosis appears to apply better to C. coronata.

646. *(c.)* ANACHIS ———, *sp. ind.*

Tablet 2424 contains a sp. too much incrusted for identification, which may be a dwarf Anachis c. pachyderma, or a distinct species.

Hab.—Mazatlan; 1 sp. off Spondylus; *L'pool Col.*

647. ANACHIS CORONATA, *Sow.*

Columbella coronata, *Sow.* in *Proc. Zool. Sow.* 1832, p. 114:—*Thes. Conch.* p. 135, no. 70, pl. 39, f. 134.—*Desh.* in *Lam. An. s. Vert.* vol. x. no. 32.
Comp. Columbella costata, *Val. Rec. Obs.* vol. ii. p. 331.
?Non Columbella coronata, *Ducl.* in *Chénu, Conch. Ill.* pl. 8, f. 17, 18.—*H. & A. Ad. Gen.* i. 182.
?=Columbella Terpsichore, *Mke.* in *Zeit. f. Mal.* 1851, p. 185, no. 64:—(non *Sow. Gen.* f. 6. W. Indies.)*

The very few specimens found at Mazatlan, and referred to this species by Mr. Gaskoin, differ not a little from the type and among themselves. Some are slender, acuminate, with the tubercles changed into costæ, except the last few. In these the ribs are very numerous and fine. Two others have more the typical shape of A. varia, with the ribs further apart, and in front slightly tubercular. They are known from the previous species by the smoothness of the upper whirls. The inside of the outer lip is more finely toothed, (the denticles running into grooves,) and is often richly stained. The painting is very fine; brownish purple pencilings on a light ground. Epidermis very thin, smooth and greenish. An elongated specimen measures *long.* ·52, *long. spir.* ·27, *lat.* ·2, *alt.* 37°.
A broad sp. „ ·52, „ ·25, „ ·26, „ 42°.

Hab.—Bay of Panama, under stones, *Cuming.*—Acapulco, Quibo; Gaskoin.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2425 contains 4 sp. The first dead, bitubercular; the second, richly coloured; the third light, finely ribbed; the fourth light, coarsely ribbed.

* The Buccinum gilvum of *Mke.* in *Zeit. f. Mal.* 1847, p. 180, no. 13, may possibly be a variety of this species. Although described as "nitida, lævigata," it is said to have 13 longitudinal ribs, gathered above into obsolete nodules, and decussated below with liræ. White lines ascend the spire. The mouth is oblong, the labrum internally lirate, and the labium not callous.

648. ANACHIS ? FULVA, *Sow.*

Columbella fulva, *Sow.* in *Proc. Zool. Soc.* 1832, p. 115 :—*Thes. Conch.* p. 138, no. 80, pl. 39, f. 148.—*Müll. Syn. Nov. Test. Viv.* p. 83.—*Lam. An. s. Vert.* vol. x. p. 281, no. 29.—*C. B. Ad. Pan. Shells*, p. 87, no. 85.—*Mke.* in *Zeit. f. Mal.* 1850, p. 184, no. 63.

Tablet 2426 contains a minute dead shell, with two normal whirls, which may belong to this species.

Hab.—Panama, *Cuming.*—Do. 3 sp. under stones near low water mark; *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan, *Menke.*—? Do.; 1 dead, young shell; *L'pool Col.*

649. ANACHIS NIGROFUSCA, *n. s.*

A. t. minore, conoideâ, marginibus spiræ plus minusve elevatæ excurvatis; nigro-fuscâ, lineis lividis, radiantibus, subundulatis, haud conspicuis; anfr. normalibus vi. *planatis, suturâ parum impressâ; costulis crebris radiantibus, ad basin continuis, interstitiis parvis spiraliter decussatis, lineis impressis; sculpturâ sæpe obsoletâ; striis spiralibus circa basin conspicuis; aperturâ oblongâ; labro varicoso, postice sinuato, intus* vii.-*dentato; labio conspicuo, sublævi; operculo unguiformi, apice antico.*

Resembles A. mæsta, nigricans, &c., and partakes of the characters of Drillia. The light lines not corresponding with the ribs gives the latter a waved appearance which does not belong to them. Only 5 fresh specimens and a dwarfed fragment were found; in which the decussation of the interstices was rarely marked. The sculpture is generally fainter on the back.

A long sp. measures *long.* ·4, *long. spir.* ·21, *lat.* ·15, *div.* 40°.
A broad sp. „ „ ·37, „ ·17, „ ·17, „ 50°.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

Tablet 2427 contains a broad sp. with strong sculpture; and a slender sp. with operculum, sculpture evanescent.

650. ANACHIS SERRATA, *n. s.*

A. t. parvâ, subelevatâ, anfr. rotundatis; fuscâ, purpureo maculatâ; anfr. iii. *nucleosis, lævibus; anfr. normalibus costis radiantibus parum tumentibus, plus minusve conspicuis, spiraliter undulantibus; lirulis spiralibus elevatis costas quasi obtuse*

serrantibus; aperturâ subelongatâ; labro intus viii.-*dentato; labio parum extante, secundum strias spirales ad basin indentato.*

This species is described from young shells and fragments of adults. Portions of about a dozen specimens were found. The sculpture more resembles Metula, but the mouth is Anachoid. The ribs are not distinctly marked, except in the young shell; but undulate, with the interstices as in Pisania. The length of the adult is not known; *lat.* ·13, *long. apert.* ·1, *div.* 40°.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Tablet 2428 contains 3 young shells and fragments.

651. ANACHIS PYGMÆA, *Sow.*

Columbella pygmæa, *Sow. Proc. Zool. Soc.* 1832, p. 119:—*Thes. Conch.* p. 141, no. 89, pl. 40, f. 163.—*Müll. Syn. Nov. Test. Viv.* p. 90.—*Chénu, Conch. Ill.* pl. 25, f. 1, 2.—*C. B. Ad. Pan. Shells*, p. 97, no. 100.

(Columbella) Anachis pygmæa, *H. & A. Ad. Gen.* i. 184.

Comp. Columbella costulata, *C. B. Ad. Contr. Conch* no. 4, p. 58, (Jamaica.) [=A. pygmæa, var. Panama, *Bridges.*]

This shell is like a minute A. costellata, but there is scarcely any spiral sculpture except in the young shell, and round the base in the adult where it is very strong. The colour varies from light horn with a few purple-brown patches, to a nearly uniform black brown. The labrum has about 6 teeth; the labium wrinkled by the basal striæ. The first four whirls are smooth and transparent, after which the normal sculpture appears. The ribs are well marked; but the interstices are not deeply chiseled. The smallest (nuclear) shell measures ·03 by ·022; the largest, *long.* ·25, *long. spir.* ·13, *lat.* ·11, *div.* 40°.

Hab.—St. Elena; on dead shells, in sandy mud, 10 fm.; *Cuming.*—Panama; common under stones at low water mark; *C. B. Adams.*—Mazatlan; extremely rare, on Spondylus; *L'pool Col.*

Tablet 2429 contains 7 young sp. in different stages of growth; and 3 adult, differing in colour.

652. ANACHIS GASKOINI, *n. s.*

A. t. parvâ, solidiore, subturritâ; albidâ, lineis fuscis angustis spiralibus, anfr. ult v., *penult.* ii.; *inter posticas duas in cost*

alternatis maculis fusco-purpureis ornata ; areâ infrasuturali candidâ, lineâ spirali vix fuscâ ; anfr. normalibus vi. *subrotundatis, suturâ impressâ ; costis circiter* xiii. *radiantibus, rotundatis, haud valde extantibus, aperturam versus subobsoletis ; interstitiis undulatis ; superficie subnitidâ, circa basin tenuiter striulatâ ; aperturâ subelongatâ, subquadratâ ; labro incrassato, intus* v.-*dentato ; dente postico valido ; labio parum extante, supra columellam corrugato ; canali brevissimo.*

This species is named in remembrance of J. S. Gaskoin, Esq. who had the kindness to bring his extensive knowledge of the Columbellidæ to bear on the Mazatlan specimens. In removing the incrustation from the only specimen found of this species, the shell proved the softer and gave way ; leaving no trace of its existence but the description and sketch in my provisional catalogue. It happened however that M. Petit had sent to Mr. Gaskoin one specimen from Callao, which so nearly agrees with the former that the above diagnosis is pretty confidently presented for it. In many respects it appears to resemble Columbella tæniata, *Phil.* in *Zeit. f. Mal.* 1846, p. 54, no. 26. *Long.* ·26, *long. spir.* ·14, *lat.* ·13, *div.* 33°.

Hab.—Mazatlan ; 1 sp. off Chama ; *L'pool Col.*—Callao ; 1 sp. in Mus. Gaskoin ; *Petit.*

Tablet 2430 contains a sketch.

653. ANACHIS RUFOTINCTA, *n. s.*

A. t. parvâ, solidiore, compactâ, spirâ parum elevatâ, marginibus excurvatis ; albidâ, aurantio pallide tinctâ, columellâ et basi aurantio-rufo dense imbutis ; anfr. iii. *nucleosis, lævibus,* iii. *normalibus ; t. juniore circa peripheriam subangulatâ, tumidâ ; costis radiantibus* xii-xv. *latis, t. juniore ad peripheriam, t. adultâ ad basin continuis, aperturam versus rarius obsoletis ; lincis spiralibus subimpressis, in costis obsoletis ; aperturâ subelongatâ ; labro intus circiter* vi.-*dentato, postice sinuato ; labio sublævi, parum extante.*

This unpretending little species is easily known from A. pygmæa and its congeners, by the very light colour, and the deep orange-red stain at the base. *Long.* ·143, *long. spir.* ·068, *lat.* ·075, *div.* 50°.

Hab.—Mazatlan ; 15 sp. (perfect or fragmentary) off Chama and Spondylus ; *L'pool Col.*

Tablet 2431 contains 2 young sp. and one adult, perfect; also two fragments exhibiting variations in sculpture.

654. ANACHIS ALBONODOSA, *n. s.*

A. t. minore, conoideâ, marginibus spiræ valde excurvatis, antice angustâ; albido-virescente, maculis et lineis ziczac-formibus castaneis irregulariter ornatâ, infa suturam vix impressam albo maculatâ; anfr. iii. *nucleosis, subeffusis, lævibus, sed propter lineas coloris pallidiores quasi corrugatis; anfr. normalibus* iv. *costis sæpe subobsoletis, planatis, juxta basin obsoletis, striis spiralibus circa basin paucis; aperturâ elongatâ, contractâ, contortâ; labro in medio arcuato, intus dentibus circiter* viii. *munito, canali postico angusto; labio continuo, labro attingente, lævi, parum extante.*

This extremely beautiful but very small species is remarkable for the appearance of corrugation (due to colour only) in the somewhat elongated nuclear whirls. A young shell has the ribs extremely faint, and the details of painting different. *Long.* ·13, *long. spir.* ·07, *lat.* ·063, *div.* 40°.

Hab.—Mazatlan; 2 sp. off Chama and Spondylus; *L'pool Col.*

Tablet 2432 contains the adult specimen.

655. ? ANACHIS ———, *sp. ind. (a.)*

Tablet 2433 contains 4 fragments of a species remarkable for its glossy texture and buff colour, irregularly spotted. The three nuclear whirls are very compact; the rest rather effuse, and with broad, flattened, but sharply chiseled ribs, resembling in the adult state the young of Col. cervinetta.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

656. ? ANACHIS ———, *sp. ind. (b.)*

Tablet 2434 contains a very young sp. with 3 nuclear and 2 normal whirls, very narrow and elongate, with fine radiating ribs; white with 3 spiral light chesnut bands.

Tablet 2435 contains a still younger sp., resembling the last but more compact; normal whirls commencing, irregularly spotted without bands, with a spiral line close to the suture.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Subgenus STROMBINA.

To which group of Columbellidæ these shells are most allied, has not yet been determined. They are ranked provisionally under Anachis.

657. Strombina maculosa, *Sow.*

Columbella maculosa, *Sow.* in *Proc. Zool. Soc.* 1832, p. 115:—*Thes. Conch.* p. 139, no. 84, pl. 40, f. 152.—*Desh.* in *Lam. An. s. Vert.* vol. x. p. 291, no. 46.—*Chénu, Conch. Ill.* pl. 12, f. 7, 8,

Strombina maculosa, *H. & A. Ad. Gen.* i. 186.

This shell is like an elongated A. coronata, being similarly painted, and having the upper whirls smooth, and the lower ones tuberculated. The second row of tubercles is scarcely indicated in the smaller (adult) specimen, while the larger one is entirely destitute of them. Base spirally striated. The largest sp. measures *long.* 1·02, *long. spir.* ·6, *lat.* ·32, *div.* 26°.

Hab.—Guacomayo, in sandy mud, *Cuming.*—Mazatlan; 2 dead specimens; *L'pool Col.*

Tablet 2436 contains the smaller (more perfect) specimen.

658. ? Strombina ————, *sp. ind.*

Tablet 2437 contains a young shell, very elongate, with 3 smooth nuclear whirls; also a fragment of an adult; surface with deep irregular pits, formed by the confluence of spiral and radiating ridges.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

Genus PISANIA, *Biv.*

Bivon, Nuov. Gen. 1832, p. 13:—*Phil. Handb. Conch.* p. 149, no. 21:—*H. & A. Ad. Gen.* vol. i. p. 83. = Pusio, *Gray.*

+ Pollia, *Gray, Zool. Beech. Voy.* 1839, p. 111:—*Phil.* loc. cit. p. 148, no. 20:— = Cantharus *(Bolt.) H. & A. Ad. Gen.* vol. i. p. 84.

659. PISANIA INSIGNIS, *Rve.*

Buccinum mutabile, (pars,) *Val. Voy. Ven. Moll.* pl. 6, f. 2, 2*a-e*, 1846; f. 2 *e,f.*, 2 *α*, *β*, *excl.* (non *Linn.*)
B. insignis, *Rve. Conch. Ic.* pl. 8, f. 58, Dec. 1846.
B. insigne, *C. B. Ad. Pan. Shells*, p. 69, no. 59.
(Cantharus) Tritonidia insignis, *H. & A. Ad. Gen.* i. 85.

If the name of *Val.* was published before that of *Rve.*, the law of priority would require that this species should be called Pisania mutabilis; but as it was given in ignorance of its preoccupation in the original genus, and also to include both this species and P. gemmata; and as Reeve's name, given in the same year, is much more widely diffused, it is here retained.

This beautiful, but by no means typical species varies in the height of spire, development of ribs, colour, and amount of basal twist. The nuclear whirls are smooth; those which follow are swollen, with the radiating costæ always well developed, and crossed by somewhat irregular spiral lirulæ, of which two are larger than the rest. On the ultimate whirls, the costæ are often nearly obsolete, and are never produced to the base. Very fine lines are seen between the principal ones, which are at irregular distances. Colour purple brown, more or less spotted with white, especially at the tubercles of the two principal lirulæ; mouth white, sometimes bordered with dark. When young, the shell somewhat resembles Fasciolaria, having a few very slanting columellar folds, without labium or teeth. It is only when quite adult that the Pisanoid form is developed. Canal rather long, bent; labium rarely thickened so as to shew an umbilical chink. Labrum generally ribbed within. Operculum resembling that of Turbinella, but thinner, less twisted; outside with irregular coarse striæ of growth, and a channel along the outer edge; inside glossy, with a few irregular lines on the muscular scar. Colour olivaceous, with a yellowish tinge inside. The shell is rarely encrusted, even with Serpulæ and Bryozoa. The largest of the specimens measures *long.* 2·08. *long. spir.* 1·13, *lat.* 1·1, *div.* 40°.
A transverse sp. „ 1·44, „ ·68, „ ·94, „ 60°.

Hab.—St. Elena; in clefts of rocks at low water; *Cuming.*—Panama; not uncommon; in the same situation, but more frequently under stones, and especially under those which were lying on sand; *C. B. Adams.*—Mazatlan; very common; *L'pool & Havre Coll.*

Tablet 2438 contains a very young sp. ·64 long, with operculum, and long canal.

Tablet 2439 contains 6 sp. normal form.—2440, 7 sp. smooth form, transverse.—2441, 10 sp. do. elevated.—2442, 9 sp. ribbed form, elevated.—2443, 9 sp. do. transverse.—2444, 5 sp. umbilicated rough var.—2445, 3 sp. recovered from severe fractures.—2447, 2 do. encrusted with Bryozoa.—2448, 1 do. epidermis orange.

Tablet 2449 contains 12 normal opercula.—2450, 6 do. repaired after fracture, generally with central nucleus.

660. PISANIA (? PAGODUS, *var.*) ÆQUILIRATA.

P. t. "P. insigni" simili, sed multo minore, anfr. valde tumentibus, costis validis ad basin continuis, liris æqualibus cinctâ quarum v. *in spirâ monstrantur; plicâ columellari basali angulatâ.*

Comp. Buccinum pagodus, *Rve. Conch. Ic.* pl. 7, sp. 50.—*C. B. Ad. Pan. Shells*, p. 70, no. 61.=Cantharus pagodus, *H. & A. Ad. Gen.* i. 85.

One dead specimen was found, differing from the most dwarfed varieties of P. insignis in the above characters. It is of a uniform reddish brown, and apparently had very fine striulæ between the ribs. It is at once known from P. gemmata by the tumidity of the whirls. It has the general aspect of Buccinum biliratum, *Rve. Conch Ic.* pl. 10, sp. 71 (Galapagos, *Cuming*), but differs in sculpture. It may be a dwarf B. pagodus; but the Cumingian type is not at present accessible; and it is rarely safe, in critical cases, to identify from the figures and descriptions in the *Conch. Ic.* alone. *Long.* ·98, *long. spir.* ·45, *lat.* ·54, *div.* 50°.

Hab.—Mazatlan; 1 dead sp.; *L'pool Col.*

Tablet 2451 contains the specimen.

661. PISANIA GEMMATA, *Rve.*

Buccinum gemmatum, *Rve. Conch. Ic.* pl. 7, f. 49.—*Mke.* in *Zeit. f. Mal.* 1850, p. 179, no. 42.

=Buccinum gemmulatum, *Mke.* loc. cit. 1847, p. 180, no. 12.

=Buccinum undosum, *fem. (Linn.) Kien. Icon. Conch.* p. 39, no. 40, pl. 12, f. 41 (pars): v. *Desh.* in *Lam. An. s. Vert.* vol. ix. p. 642, no. 31, not. (1).

(Cantharus) Tritonidea gemmatus, *H. & A. Ad. Gen.* i. 85.
= Buccinum mutabile (pars), *Val. Voy. Ven.* pl. 6. f. 2 *e*. *f*. 2, 2 *a-c* exclus.: (2 *α*, *β*, are intended for the operculum, which they do not resemble. They are probably over-wrought figures from a deformed specimen.)

This species, figured by *Kien.* as the female of B. undosum (teste *Rve.* in loc. sp. 55,) finds an E. Indian analogue in B. Proteus, *Rve.* sp. 51. [?=B. Coromandelianum, *(Lam.) Kien. Icon. Conch.* p. 37, no. 38, pl. 22, f. 85.] It is known at once from the depressed variety of P. insignis, and from P. æquilirata, by the flatness of the upper whirls: and from the former, by the sharpness of the spiral lirulæ, which are black at the points. The epidermis is not quite so coarse; and beneath, the shell is of a prevailing black-brown, with more or less of white markings, especially a spot at the back of the last rib, near the suture. The three upper whirls are smooth: the succeeding ones flat, deeply pitted by the intersection of transverse and spiral ribs; suture not conspicuous. The shells are rarely incrusted; and vary but little, in the elevation of the spire, and strength of the transverse costæ (which are generally very obscure), and of the spiral lines. These are at nearly regular distances, except that the second below the suture is missed on the last two whirls. Between each are three or four fine spiral striæ. The last rib is much thickened, with a small posterior canal bounded by a sharp parietal plait. The varix is hollow at first, then filled up, and grooved within, ending in more or less sharp serrations at the margin. Columella with one slight Fasciolaroid plait; labium warty near the base, very slightly above. Mouth pure white, edged with black in the young state. Operculum like that of P. insignis; but swollen, darker, without the olivaceous and internally yellowish tinges. The shells are rarely fractured, being very strong; but the opercula are frequently damaged, and when renewed are frequently ovate with the nucleus more or less central. The largest specimen measures *long.* 1·34, *long. spir.* ·54, *lat.* ·87, *div.* 70°.
An elevated sp. „ 1·42, „ ·55, „ ·7, „ 60°.
The smallest „ ·52, „ ·2, „ ·28, „ 50°.

Tablet 2452 contains 6 sp. young and adolescent.—2453, 7 sp. broad form.—2454, 6 do. normal form.—2455, 4 do. acuminated form.—2456, 2 sp. costæ developed.—2457, 3 do. spiral lines developed.—2458, 3 sp. shewing colour and repaired fracture.—2459, 12 normal opercula.—2460, 4 do. subovate.

662. PISANIA SANGUINOLENTA, *Ducl.*

Purpura sanguinolenta, *Ducl.* in *Guer. Mag. Zool.* pl. 22, f. 1, 1833.
Buccinum sanguinolentum, *Mke.* in *Zeit. f. Mal.* 1847, p. 180, no. 11.—*C. B. Ad. Pan. Shells*, p. 72. no. 64.
Pollia hæmastoma, *Gray, Zool. Beech. Voy.* p. 112, 1839.
Buccinum hæmastoma, *Rve. Conch. Ic.* pl. 7, f. 46.
Buccinum Janelii, *Val. Voy. Ven. Moll.* pl. 6, f. 1, 1*a-c.* 1846.
Tritonium verrucosum, *Mke. ms.* loc. cit.
(Cantharus) Tritonidea sanguinolentus, *H. & A. Ad. Gen.* i. 85.

This extremely beautiful species is constantly distinguished from P. gemmata by its small size, colour, and details of sculpture. The three nuclear whirls are smooth and subtransparent; the succeeding ones, as in P. gemmata, but less indented. The last two have in the middle of each whirl about nine elongated projecting tubercles rather than ribs, with a broad depression between these and the subsutural granulose line. Spiral sculpture faint except on the tubercles, where the narrow tips of the principal lirulæ are brownish red: between each are 6-8 fine striulæ. Epidermis very thin, deciduous. Surface frequently encrusted with Bryozoa, Annelids, and very rarely with coralline. One young fresh specimen was found on Spondylus. Labrum as in Pisania gemmata, with a very stout tubercle behind the posterior canal: inside more or less grooved, ending in sharp serrations, generally projecting in pairs between the principal lirulæ. Columella with one Fasciolaroid fold. Labium covered all along with numerous warts, white on a blood-red ground, which vary in shape and size. Canal short. Colour a prevailing greenish brown, with brownish red on the tips and round the mouth. Operculum scarcely differing from that of P. gemmata, but rather flatter, with the external groove scarcely marked. An adult, which appears as if the animal had been starved, with the tubercles scarcely developed, measures *long.* ·72, *long. spir.* ·25, *lat.* ·44, *div.* 60°.
An unusually large sp. 1·26, „ ·56, „ ·8, „ 57°.

Hab.—Panama; under stones at low water; *Cuming.*—Do.; and Taboga, same station, and probably lower, very rare; *C. B. Adams.*—Mazatlan; rare; *L'pool Col.*

Tablet 2461 contains 5 sp. in process of growth.—2462, 4 sp. adult, different sizes.—2463, 3 sp. encrusted.—2464, 3 opercula, of which one is ovate, distorted, nucleus subcentral.

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663. PISANIA RINGENS, *Rve.*

Buccinum ringens, *Rve. Conch. Ic.* pl. 7, sp. 45.—*C. B. Ad. Pan. Shells*, p. 71, no. 63.—(Non *Phil.* in *Zeit. f. Mal.* 1851, p. 59.)

(Cantharus) Tritonidea ringens, *H. & A. Ad. Gen.* i. 85.

This species (if it prove such) differs from P. sanguinolenta in the inconstancy of its characters. Of the three Mazatlan specimens, one would pass for a dead P. sanguinolenta, the second is intermediate, the third nearly as ringent as Reeve's figure. They have 9, 10 and 11 tubercular ridges respectively. Spire rather more depressed: infrasutural tubercles stronger, with the depression narrower: labral serrations not projecting: canal more twisted: mouth white: warts fewer, in two irregular rows, of which the inner are elongated. The more typical sp. measures *long.* ·84, *long. spir.* ·19, *lat.* ·64, *div.* 70°.

The aberrant sp. „ 1·12, „ ·37, „ ·76, „ 60°.

Hab.—Panama; on rocks at low water; *Cuming.*—Do.; under stones near low water of neap tides, common; *C. B. Adams.*—Mazatlan; 3 dead sp.; *L'pool Col.*

Tablet 2465 contains the two specimens above measured.

GENUS MUREX, *Linn.*

664. MUREX PLICATUS, *Sow.*

Proc. Zool. Soc. 1840, p. 139:—*Conch. Ill.* p. 2, sp. 15, f. 6.—*Rve. Conch. Ic.* sp. 87, pl. 21, f. 87: (non pl. 22, f. 87, sp. 97 pro 87 bis; non sp. 97 pl. 24.)

? = Murex unidentatus, *Mke.** in *Zeit. f. Mal.* 1850, p. 186, no. 66; (non *Sow. Conch. Ill.* f. 58.)

Comp. M. ternispina, *Mke.** loc. cit. no. 67; (? non *Lam.*)

Only one dead specimen of this shell was found. It is remarkable for the long spines on the base and canal, while those on the spire are very short. *Long.* 2·3, *long. spir.* ·65, *lat.* 1·3, *div.* 80°.

Hab.—Gulf Nicoya; in coarse sand, 12 fm. *Cuming.*—Mazatlan; one dead sp.; *L'pool Col.*

Tablet 2466 contains the specimen.

* Menke says of his M. unidentatus, that it is the shell quoted by him in his *Moll. Nov. Holl.* no. 109, as M. crassispina. This and his M. ternispina are probably either varieties of M. plicatus, or imported from his purchased box, as both the original species are E. Indian.

665. MUREX ? RECURVIROSTRIS, *var.* LIVIDUS.

Murex recurvirostris, *Brod.* in *Proc. Zool. Soc.* 1832, p. 174.—*Müll. Syn. Nov. Test. Viv.* p. 92.—*Rve. Conch. Ic.* pl. 19, f. 75.—*C. B. Ad. Pan. Shells*, p. 124, no. 140.

Murex recurvirostrum, *Sow. Conch. Ill.* pl. 59, f. 9, no. 13.

Murex messorius, *Mke.* in *Zeit. f. Mal.* 1850, p. 186, no. 65. (Non *Sow. Proc. Zool. Soc.* 1840, p. 137;—*Conch. Ill.* no. 9, f. 93.—*Kien. Icon. Conch.* p. 9, no. 5, pl. 10, f. 2.—*Desh.* in *Lam. An. s. Vert.* vol. ix. p. 602, no. 69.—*Rve. Conch. Ic.* sp. 90.)

Comp. M. nigrescens, *Sow. P. Z. S.* loc. cit.:—*Conch. Ill.* no. 12, f. 113.—*Rve.* loc. cit. sp. 92. (Xipixapi, *Cuming.*—=M. messorius, var. teste *Kien.* non *Desh.*)

Comp. M. rectirostris, *Sow. P. Z. S.* p. 138:—(M. rectirostrum,) *Conch. Ill.* no. 11, f. 111.—*Rve.* loc. cit. sp. 91—*C. B. Ad.* loc. cit. no. 139. (Xipixapi, *Cuming.*—=M. messorius, var. teste *Kien.* non *Desh.*)

Comp. M. funiculatus, *Rve.* loc. cit. sp. 74.

M. ?recurvirostris t. lividâ, fusco-aurantio supra liras cinctâ; spirâ depressâ seu subelevatâ: costis intervaricalibus ii. *seu* iii., *ultimis sæpe obsoletis; liris spiralibus, varices transeuntibus; varicibus* iii. *plus minusve conspicuis, rotundatis, postice indentatis; varice ultimo spinâ unicâ suturam versus plus minusve conspicuo, spinulis canalem versus minimis, antice declivibus, in canali uno, haud hamato; varicibus penultimis sæpe spinis* ii. *rarius* iii. *in canali, spinis parvis anticis medianis; anfr.* iv *primis abnormalibus, quorum primus declivis, in adultâ semper decollatus, proximus lævis, proximi cancellati; labro extante, crenato; labio extante; tuberculis intus in labro, sæpius in labio quoque minoribus, ornatâ; canali interdum recto, interdum plus minusve recurvato; operculo tenuiore, margine acuto, rubro-fusco; extus rugis incrementi, intus nitente; cicatr. musc. normaliter rugulis paucis incrementi, interdum corrugatâ; ovatâ, nucleo terminali.*

The Mazatlan specimens, (of which I have carefully examined about 300) are referred by Menke to M. messorius, by Mr. Cuming doubtfully to M. nigrescens, by Mr. Hanley to M. recurvirostris. If the species above cited are all distinct, the Mazatlan form may be distinct also; but probably the examination of other local forms may prove some of them to be identical. That the Mazatlan specimens are of one species, I

can have no doubt. The most acuminated form, in which the first whirls scarcely touch, exactly agrees with the figures of M. rectirostris: others are as depressed as M. recurvirostris; most take the form of M. nigrescens. In colour they most accord with M. funiculatus, but never approaching the characteristic painting of that species. They differ from M. nigrescens and M. recurvirostris in the constant spines on the spire; from M. messorius (which is probably an analogous Atlantic species; Senegal, Kiener,) in the straightness of the canal spines. The Mazatlan species is characterized, in all its varieties, by a light bluish slate colour, with orange brown on the spiral ribs; the last varix always having one short spine above the periphery, none below on the middle, but a few scaly ones on the front side (the back being pitted) and one spine on the canal; the preceding ones either having the same sculpture, or developing medial short spines, and two (rarely 3) on the canal. There is a tendency to irregular growth in the canal, but it is generally straight with the axis of the shell. Living specimens are scarcely ever incrusted. A normal sp. measures *long.* 2·06, *long. spir.* ·45, *long. canal.* 1· *lat.* 1· *div.* 80°. An acuminated specimen of the same breadth, has *long. spir.* ·65, *div.* ·65°. A large specimen (including spines, excluding canal) measures *long.* 1·24, *lat.* 1·14. The smallest, with perfect apex, canal probably broken, measures ·78 by ·5.

Hab.—(M. recurvirostris. Gulf Nicoya in sandy mud, 9 fm.; *Cuming.*—Panama, 1 imperfect sp. *C. B. Adams.*)—Mazatlan; not common; *L'pool Col.*

Tablet 2467 contains 3 sp. normal growth.—2468, 1 do. form of M. rectirostris, labium nearly smooth, with Ostreæ.—2469, 1 do. varices thin.—2470, 2 do. much swollen.—2471, 1 do. spines developed.—2472, 1 do. labial tubercles developed.—2473, 5 sp. shewing changes of intervarical costæ; the first, at the end, obsolete; the second, with one; the third, with two; the fourth, with three; the fifth, behind the penultimate varix, with four, ill developed.—2474, 3 sp. canal twisted.—2475, 1 sp. with egg case.—2476, 1 sp. with repaired fracture.—2477, 2 sp. orange tint developed.—2478, 1 sp. with burrow of Gastrochæna along the penultimate varix. The creature not having room to construct a siphon gallery, has made a projecting pipe.—2479, 1 sp. with operculum abnormal, nucleus central.—2480, 2 normal and 2 abnormal opercula.

Subgenus PHYLLONOTUS, *Swains.*

Varices numerous, often irregular; foliated or branching.

666. Phyllonotus nigritus, *Meusch.*

Murex nigritus, *Phil. Abbild.* pt. viii. p. 3, pl. 1, f. 1.—*Rve. Conch. Ic.* pl. 42, f. 47.—*Mke.* in *Zeit. f. Mal.* 1850, p. 188, no. 73.

+ Murex ambiguus, *Rve. Proc. Zool. Soc.* 1845, p. 86:—*Conch. Ic.* pl. 13, f. 51.—*Mke.* in *Zeit. f. Mal.* 1850, p. 188, no. 74:—(? non *C. B. Ad. Pan. Shells*, p. 122, no. 138, var.)

Comp. Murex radix, *Gmel.* p. 3527, no. 10.—*Lam. An. s. Vert.* vol. ix. p. 584, no. 36.—*C. B. Ad. Pan. Shells*, loc. cit.

The form ambiguus is distinguished from the M. nigritus of *Phil.* by the broader shape, eight varices, more pinnate expansions, and deeper colour in the mouth. Dr. Menke prides himself on his superior facility for discriminating the species, in consequence of possessing no fewer than 8 very fine specimens. Having carefully examined many hundred shells in the finest state of preservation, I am unable to substantiate the difference. The great bulk of the adult Mazatlan specimens belong to the form ambiguus, which is the typical state of the species, when grown under the most favourable circumstances. The form nigritus, as figured by Philippi and Reeve, of which very few adult specimens occurred in this collection, appears to be caused by a deficiency in what the animal requires for its full development. Almost all the young specimens however are of the form nigritus, only one having been found with finely pinnate varices. The number of spiny processes varies greatly in different shells, as also does the amount of their pinnation. The operculum, which is remarkable, presents exactly the same characters in the young and adult nigritus, and in the ordinary ambiguus. The amount of elevation in the spire is extremely variable in the form ambiguus; it is generally much depressed, as in M. radix, but sometimes pointed, and with the outlines incurved. The number of varices varies from 6-9 in the young shells; from 7-9 in the adult nigritus; and from 8-13 in the adult ambiguus. Whether the species be distinct from M. radix, cannot yet be determined. Individuals of each closely approach each other. Thus far however the provinces are distinct, M. radix not having been found north of Acapulco, nor M. nigritus so far south. The form radix is much heavier,

with slightly developed but very numerous varices. The shells doubtfully assigned to Mr. Reeve's ambiguous species by Prof. Adams, appear to be finely grown specimens of M. radix.*

Shell of light growth, with a variable number of varices, generally 7 in the young and 9 in the adult state, with a variable pattern of open; more or less pinnate fronds, black within. These fronds are the expansions of rounded spiral ribs. The whole surface often very finely spirally striated. Base of columella twisted: canal nearly covered, bent, leaving a rather large spiral umbilicus. Labium generally stained with black. Groundwork of the shell white, with black ribs. Operculum ovate, much bent, nucleus near the margin, with irregularly laminated ridges of growth; on the outer border rising into very crowded erect serrated laminæ; colour dark horny brown, scarcely tinged with orange or red; muscular scar large, corrugated like the human hand from a center on the inner margin. The smallest of the specimens, (including spines,) measures *long.* 1·75, *long. spir.* ·52, *lat.* 1·25, *div.* 80°.
The largest „ 7·, „ 1·7 „ 5·7, „ 100°.

Hab.—Mazatlan; abundant and extremely fine, among very fine sand; *L'pool & Havre Coll.*

Young state.—Tablet 2481 contains 5 young sp. passing from form nigritus to form ambiguus.—2482, 1 sp. jun. six varices.—2483, 1 do. six and a half.—2484, 1 do. seven.—2485, 1 do. seven and a half.—2486, 1 do. eight.—2487, 1 do. eight and a half.—2488, 1 do. nine.

Form *nigritus*, Phil.—2489, 1 sp. seven varices.—2490, 1 do. very fine, seven and a half.—2491, 1 do. eight.—2492, 1 do. from a shop, locality unknown, displaying nine varices.

Form *ambiguus*, Rve.—2493, 1 sp. dark, smooth, (lip rather broken) eight varices. The middle part of the last three varices takes the form nigritus, in consequence of an accident.—2494, 1 sp. nine varices.—2495, 1 sp. labium scarcely stained, spire outlines excurved, ten varices.—2496, 1 sp. (lip rather broken) labrum dark, eating away the lower part of an old varix, eleven varices.—2497, the largest sp., twelve varices.—2498, 1 sp. thirteen varices.

Almost all the above specimens have opercula. Tablet 2499 contains 3 others, of which two are distorted, with subcentral nucleus.

* Of this species, though now extremely common, Lamarck thus writes: "Shell very rare and very precious. I do not possess it; but I have had an opportunity of observing and examining its characters."

667. PHYLLONOTUS NITIDUS, *Brod.*

Murex nitidus, *Brod. Proc. Zool. Soc.* 1832, p. 175.—*Sow. Conch. Ill.* p. 6, no. 84, f. 4.—*Rve. Conch. Ic.* pl. 17, sp. 70.

The shell figured by Sowerby was supposed by him, and by Kiener, (and may prove to be,) the young of M. princeps: that figured by Reeve more nearly resembles M. nigritus, jun. Whether it be really distinct must be decided by those who have examined a series. The solitary Mazatlan shell very closely approaches the extreme form in tablet 2481. It differs chiefly in the great prolongation of the shoulder frond. *Long.* 1·6, *long. spir.* ·46, *lat.* ·9, (+spines ·75,=1·65,) *div.* 95°.

Hab.—Real Llejos, Sowerby.—Guacomayo; on coral reefs at low water; *Cuming.*—Mazatlan; 1 dead sp. with M. nigritus; *L'pool Col.*

Tablet 2500 contains the specimen.

668. PHYLLONOTUS BRASSICA, *Lam.*

Murex brassica, *Lam. An. s. Vert.* vol. ix. p. 581, no. 33.—*Potiez & Mich. Cat. Douai.* p. 418, no. 25.—*Zool. Beech. Voy.* p. 108, pl. 33, f. 1.—*Sow. Conch. Ill.* no. 80, f. 56.—*Kien. Icon. Conch.* p. 68, no. 49, pl. 26, and 27, f. 1.—*Rve. Conch. Ic.* pl. 14, f. 56.—*Mke.* in *Zeit. f. Mal.* 1850, p. 187, no. 69.

Murex ducalis, *Brod. & Sow. Zool. Journ.* vol. iv, p. 377.

This magnificent species was very rare in the L'pool Col. but not uncommon in the Havre Col. There are about 8 varices denticulated, but scarcely expanded except at the base, where (and on the canal) are about 4 foliations. Behind the labrum are one large tubercle at the shoulder, and three or five below, open from within. Posterior canal foliated. Columella slightly twisted; anterior canal nearly covered, recurved, leaving a small umbilicus, labium separate. Epidermis extremely thin, ashy; mouth pinkish red. Surface densely crowded with extremely minute spiral granular lines. Operculum ovate, excurved, with a groove from the subcentral nucleus to the posterior end: interior side with laminæ of growth; exterior with sharply raised laminæ, not serrated: muscular scar spirally corrugated from the central nucleus: colour horny brown. *Long.* 7', *long. spir.* 2', *lat.* (with tubercles,) 6', *div.* 95°.

Hab.—Gulf of California; in rocky places, 4-6 fm.; Mus. Cuming.—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 2501 contains a magnificent, uncleaned specimen, with operculum.—2502, an operculum differing from the rest in having the inner edge more truncate, and the corrugations irregular. It may be an abnormal form of this species, or may belong to Ph. bicolor.

669. PHYLLONOTUS BICOLOR, *Val.*

Murex bicolor, *Val.* in *Humb. & Bonpl. Rec. Obs.* p. 301.—*Rve. Conch. Ic.* pl. 11, f. 44.—*Kien. Icon. Conch.* p. 67, no. 48, pl. 28, f. 1.—*Sow. Conch. Ill.* no. 91.—*Mke.* in *Zeit. f. Mal.* 1850, p. 187, no. 70.

Murex erythrostomus, *Swains. Zool Ill.* series ii. vol. ii. pl. 73.—*Desh.* in *Lam. An. s. Vert.* vol. ix. p. 610, no. 81.

Murex regius, *Schub. & Wagn.* in *Chemn. Suppl.* vol. xii. p. 133, pl. 230, f. 4066-7, (non *Swains.*)

Var.=Murex hippocastanum *Phil. Ic.* pl. 1, f. 2, (teste *Rve.* non *Linn.*)

Vide *Kust. Mart.* pl. 5, f. 1, 2.

Shell closely resembling M. imperialis, *Swains. (Lam. An. s. Vert.* vol. ix. p. 611, no. 82,); with 6 varices, each having a posterior canal, an adjacent open spine, and about 8 others behind the labrum, which is deeply denticulated. Between each varix is a false varix with about 4 spiny tubercles. Surface foliated behind the posterior canal. Outside covered with extremely fine spiral striæ, decussated by equally fine laminæ of growth which are undulated by the striæ. Labium expanded, raised, and, with the mouth, pink. Siphonal canal greatly bent, nearly covered, scarcely leaving an umbilicus. *Long.* 5·8, *long. spir.* 1·6, *lat.* 4', *div.* 100°.

Hab.—Gulf of California; on mud banks at low water; *Lieut. Babb.*—Acapulco, *Humboldt & Bonpland.*—Mazatlan; very rare; *L'pool & Havre Coll.*

Tablet 2503 contains one of the three sp. which alone were found in the L'pool Col. Several specimens in the London shops were probably from the Havre Col.

670. PHYLLONOTUS REGIUS, *Swains.*

Murex regius, *Swains.* in *Bligh Cat.* p. 16, no. 201, 806 (non descr.)—*Wood, Ind. Test. Suppl.* pl. 5, f. 13.—*Sow. Conch. Ill. Cat.* no. 89.—*Kien. Icon. Conch.* p. 65, pl. 42, 43, f. 1.—

Desh. in *Lam. An. s. Vert.* vol. ix. p. 610, no. 80.—*C. B. Ad. Pan. Shells*, p. 124. no. 141.
Phyllonotus regius, *Swains. Exot. Conch.* pl. 5, f. 15.
Murex tricolor, *Val.* in *Humb. Rec. Obs.* vol. ii. p. 300.

Shell with 6-8 double varices uniting near the suture, where the posterior canal and two spines are open; about 10 others lie behind the labrum, still open, the upper one on the siphonal canal crossing the others. These are longer and narrower than in M. bicolor. Labrum deeply channeled to correspond. No false varix between the others. Labium expanded, not much raised. Siphonal canal scarcely bent, almost covered, leaving a small umbilicus. Mouth pinkish red, spotted with black on the edges. Surface covered with subgranular spiral lines. About 300 specimens sent in the L'pool Col. were acidulated and sold off: the specimens here inserted are from the S. W. Mexican collection. *Long.* 4·6, *long. spir.* 1·, *lat.* 3·5, *div.* 100°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Panama; on mud banks at low water, (teste Rve.) *Cuming.*—Panama; in crevices of rocks between low water marks of spring and neap tides, common and fine, (5·3 by 4·2 in.); *C. B. Adams.*—S. W. Mexico, *P. P. C.*—Mazatlan; not uncommon; *L'pool & Havre Coll.*

Tablet 2504 contains 2 sp. not cleaned.

671. PHYLLONOTUS PRINCEPS, *Brod.*

Murex princeps, *Brod.* in *Proc. Zool. Soc.* 1832, p. 175.—*Sow. Conch. Ill.* no. 83, p. 43.—*Kien. Icon. Conch.* p. 56, no. 40, pl. 29, f. 1.—*Desh.* in *Lam. An. s. Vert.* vol. ix. p. 609, no. 79.—*Rve. Conch. Ic.* pl. 6, f. 23, pl. 36, f. 24.

Shell with about 7 varices, each with 3 pinnate fronds, and smaller palmulæ, open from the labrum, which is channeled and armed with white teeth within. On the siphonal canal (which is broad, scarcely bent, and almost closed) are two fronds, of which one crosses the lower labial frond. Labium short, and, with the mouth, white with a narrow brown rim. Columella scarcely bent. Posterior canal short, not foliated, marked off by a parietal tooth. The Mazatlan specimens are much more elevated than those figured by *Sow. Kien.* and *Rve.* It is presumed that this creature is very sluggish in its habits, as the whole shell, as far as the penultimate varix, is usually thickly incrusted with coralline, coral, Vermetidæ, &c. Oper-

culum closely resembling that of Ph. nigritus, but generally more orange, and without the exterior serrated laminæ. The largest sp. measures *long.* 5·5, *long. spir.* 2·, *lat.* 3·3, *div.* 80°.

Hab.—Puerto Portrero, *Cuming.*—Mazatlan; rare; *L'pool & Havre Coll.*

Tablet 2505 contains a remarkably clear specimen.—2506, the largest, much incrusted. Both specimens have their opercula.

Subgenus MURICIDEA, *Swains.*

Muricidea + Ocinebra, *H. & A. Ad. Gen.* vol. i. p. 75.—Varices indistinctly marked off.

672. Muricidea ? lappa, *Brod.*

Murex lappa, *Brod. Proc. Zool. Soc.* 1832, p. 177.—*Rve. Conch. Ic.* pl. 30, f. 142.—*Mke.* in *Zeit. f. Mal.* 1850, p. 188, no. 71.

Comp. M. radicatus, *Hinds* in *Proc. Zool. Soc.* 1843, p. 128.—*Zool. Sulph. Voy.* p. 9, pl. 3, f. 21, 22.—*Rve. Conch. Ic.* pl. 31. f. 148.

Muricidea lappa. *H. & A. Ad. Gen.* i. 75.

The solitary Mazatlan specimen appears intermediate between the species above quoted. The last varix occupying the place of two, it is hard to say whether it has 5 or 6. The spire is rubbed, shewing sharp angles at the varices. The last is very complex; rising behind, with minutely imbricated scales, into sharp palmations, which have numerous layers one inside the other; in front are numerous additional rows, each shorter than the last, ending in a simple serrated margin, scarcely ribbed within. Labium very prominent, sharp, not reflected or plaited, rounded posteriorly. Shell white. Canal bent, almost covered in. *Long.* 1·, *long. spir.* ·45, *lat.* ·54, *div.* 50°. Thickness of last varix, ·23.

Hab.—(M. radicatus) San Blas; in mud, 11 fm.; *Hinds.*—(M. lappa) St. Elena; on a rocky bed, 12 fm.; *Cuming.*—Mazatlan; 1 sp. only; *L'pool Col.*

Tablet 2507 contains the specimen.

673. Muricidea dubia, *Swains.*

Murex dubius, *Sow. Conch. Ill.* no. 119, pl. 61, f. 23.—*Rve. Conch. Ic.* pl. 26, f. 116.—*C. B. Ad. Pan. Shells,* p. 121,

no. 136.—*Mke.* in *Zeit. f. Mal.* 1850, p. 188, no. 72.
= Murex aculeatus, *Wood, Ind. Test. Suppl.* pl. 5, f. 19, (non *Lam.*)

One adult specimen only was found, in exquisite condition. It is more elevated even than Sowerby's figure, and only has a general resemblance to that of Reeve. It seems nearer to Pisania than to Murex; not having any varical lines, and presenting a toothed mouth. There are 7 tubercular ridges, crossed by very numerous minutely imbricated, spiral striæ: of these seven are larger than the rest, not imbricated, of which two, the second very angular, shew on the spire. Colour black brown, black on the tips of the tubercles, with an extremely thin epidermis. Labrum with hollowed varix, and five tubercles within. Columella with two plaits (as far as the eye can reach) of which one bounds the canal, the other ends in a tubercle. No parietal plait or posterior canal. Operculum unknown. *Long.* 1·06, *long. spir.* ·53, *lat.* ·6, *div.* 50°.

Hab.—Panama, *Cuming.*—Do. not uncommon, under stones near low water mark; *C. B. Adams.*—Mazatlan; 1 fresh sp. adult, and 2 young shells; *L'pool Col.*

Tablet 2508 contains a young shell, ·36 by ·24, which appears like the spiny depressed form figured by Reeve. It may however prove to be the young of M. lappa.

Tablet 2509 contains the adult specimen.

674. MURICIDEA ? ERINACEOIDES, *var.* INDENTATA.

Murex erinaceoides, *Val. Rec. Obs.* vol. ii. p. 302.
Comp. Murex alveatus, *Kien. Icon. Conch.* p. 24, pl. 46, f. 2.—*Rve. Conch. Ic.* pl. 32. sp. 157, f. 157, 163.

M. t. elevatâ, angustâ, albâ, fusco strigatâ et maculatâ; varicibus iii. *veris et* iii. *falsis, intermediis, rotundatis, supra suturam continuis, lineis* vi. *subspiralibus, ad apicem ascendentibus; suturâ ad interstitias profunde indentatis; costulis spiralibus, juxta varices valde indentatis, et striulis exillimis, minimis, confertissimis, ornatâ; labro intus lirulis* vi., *labio continuo, lævi; canali haud elongato, solido.*

The description of Val. is not sufficiently minute to identify this species with certainty. Only one dead shell was found in the *L'pool Col.*, and two others were obtained from a shop. It has the general aspect of the common forms of M. erinaceus; but is known by the extremely minute spiral striation, and the

varices, which continue over the suture, leaving deep pits, and spirally ascending the spire as in Scalaria hexagona. *Long.* 1·34, *long. spir.* ·6, *lat.* ·67, *div.* 40°.

Hab.—Acapulco, *Humboldt & Bonpland.*—Mazatlan; 1 dead sp.; *L'pool Col.*

Tablet 2510 contains the specimen.

675. MUREX ———, *sp. ind.*

Tablet 2511 contains one extremely young shell with sharp ribs, sparsely decussated, white; and an older one, rubbed, which perhaps is not conspecific; bearing a general resemblance to the young of M. erinaceus.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

676. MURICIDEA PAUXILLUS, *A. Ad.*

Murex pauxillus, *A. Ad.* in *Proc. Zool. Soc.* 1853, p. 71.

This very small species is known from the young of its congeners by its very elongated form, and its delicate texture and sculpture. Between the varices it is transparent, of a light horn colour, with spiral purplish brown bands. It has 7 indistinct varices, not continuous, sharp, crossed by a few spiral ribs, of which one, generally bifid, is conspicuous on the spire. The whole surface is covered with imbricated layers of growth. Labrum with 5 tubercles inside; labium smooth, not prominent. Canal rather open, short. Nuclear whirls often solid. Operculum Pisanoid, narrow, apex terminal, reddish brown, transparent at the edge; scar with a few lines of growth. Epidermis extremely thin. An unusually large specimen measures *long.* ·55, *long. spir.* ·28, *lat.* ·29, *div.* 33°.

Hab.—Mazatlan; rare; *L'pool Col.*

Tablet 2512 contains 1 sp. normal state.—2513, 3 do. elongated, one with operculum in situ, and a separate operculum.—2514, 1 sp. spire depressed.

Tablet 2515 contains 4 (out of 13) opercula which were found among the fragments of Spondylus, and which have not been identified with any species. They are ovate, with the nucleus terminal and rounded; very thin, orange horn-coloured; with a few ridges of growth and a large muscular scar.

[The following species are out of their order, having been discovered among Spondylus fragments received during the progress of the work.]

[FAMILY PETRICOLIDÆ.]

GENUS NARANIO, *Gray.*

Ann. & Mag. Nat. Hist. 1853, vol. xi. p. 38.—*B. M. Cat. Ven.* p. 215.
Petricola sp., *auct.*
Choristodon, *H. & A. Ad. Gen.* vol. ii. p. 441: non *Jonas.**

680.† ? NARANIO SCOBINA, *n. s.*

? N. t. transversâ, quadratâ, albidâ: extus creberrime granulis in lineas diagonaliter transversis, instructis; marginibus incrementi, sæpe extantibus; umbone latâ; satis prominente, areâ lunulari magnâ: dent. card. iii. *quarum unus prominens et alter inconspicuus parallelis ab umbone postice radiant; alter hamatus, ab altero disjunctus marginem anteriorem continuat; nympho satis elongato.*

The great peculiarity of this shell is in the separation of the cardinal margin. One tooth is formed by the twisting round of the anterior margin; the other teeth, of which one is nearly obsolete, radiate from the umbo towards the posterior end; the space between being hollowed out, and as it were open to the outside. Only one valve was found,‡ which measures *long.* ·09, *lat.* ·13, *alt.* ·03.

Hab.—Mazatlan; 1 valve off Spondylus; *L'pool Col.*

Tablet 2516 contains the specimen.

[FAMILY MYIDÆ.]

681. ? MYA ———, *sp. ind.*

Tablet 2517 contains a hinge fragment, with a deeply sunken ligament-process resembling Mya.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

* The Choristodon typicum of Jonas is the West Indian analogue of Petricola robusta, *Sow.* Having carefully compared a specimen from the sponge of commerce with adolescent Petricolæ in the Mazatlan collection, I am unable to detect even a specific difference between them. The shape, minute sculpture of the valves, and other marked characters are identical. The Petricola is usually seen in its adult state, with the hinge teeth nearly obliterated.

† No. 677 belongs to the Lepralia, 678 to the Cellepora, and 679 to the Tubulipora, indicated in page 6.

‡ The little valve deposited on tablet 781 (*vide* page 169, no. 220,) appears to be a different species of the same genus.

[FAMILY CORBULIDÆ.]

682. ? CORBULA ———, *sp. ind. (b,)*

Tablet 2518 contains a delicate white valve, of regular Arcoid shape, extremely thin, with very faint radiating lines. Hinge with pit and tooth scarcely perceptible.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

683. SPHÆNIA ———, *sp. ind.*

Tablet 2519 contains a valve differing from Sph. fragilis in having strong sharp concentric ridges, with a few radiating lines.

Hab.—Mazatlan; extremely rare; off Spondylus; *L'pool Col.*

684. ? SPHÆNIA ———, *sp. ind.*

Tablet 2520 contains the remains of a shell of Sphænoid growth, but of Myoid hinge, which was nestling in an empty Balanus on Uvanilla olivacea.

Hab.—Mazatlan; extremely rare; *L'pool Col.*

[FAMILY PANDORIDÆ.]

693* ? LYONSIA ———, *sp. ind.*

Tablet 2528 contains a minute white valve, not perfect, of Rupellaroid shape, but with a hinge and texture nearer to Lyonsia. Outside with faint irregular concentric ridges, ending here and there, on the posterior dorsal margin, in a decided spine. Inside with a slight anterior tooth-like process, and a small cartilage bed. It appears to be minutely punctate. When perfect, it would have measured *long.* ·04, *lat.* ·05, *alt.* ·012.

Hab.—Mazatlan; one valve in the frond of Murex nigritus; *L'pool Col.*

* This species, with No. 694, have just been found in carefully cleaning the fonds of M. nigritus, along with another valve of Leda Elenensis, Gouldia varians, Lucina Mazatlanica, Alaba supralirata, &c. The numbering of the species is arranged so as not to break the correspondence with the list in the British Association Report, already printed.

[FAMILY TELLINIDÆ.]

686.* TELLINA ———, *sp. ind. (c.)*

Tablet 2521 contains two valves, in form resembling T. donacilla; but with external concentric sculpture continuous instead of alternating. The young shell is extremely thin, with the sculpture in sharp ridges, rosy; the larger is very thick for its size, yellowish, with the ridges broad and rounded. It is probable that they belong to different species. Inside with a strong bifid tooth between two pits; lateral teeth none.

Hab.—Mazatlan; extremely rare, off Spondylus; *L'pool Col.*

[FAMILY CARDIADÆ.]

687. CARDIUM ROTUNDATUM, *n. s.*

C. t. parvâ, æquilaterali, ventricosâ, albâ; costibus circiter xxii. *acutis, vix granosis, quarum ventrales circiter* viii. *majores; interstitiis latis, planatis, vix decussatis; dent. lat. haud distantibus.*

Of this beautiful little shell two opposite valves were found, apparently belonging to each other. It resembles C. alabastrum, but with more numerous and less conspicuous ribs. *Long.* ·063, *lat.* ·065.

Hab.—Mazatlan: extremely rare, off Spondylus; *L'pool Col.*

Tablet 2522 contains the two valves.

[FAMILY KELLIADÆ.]

688. LASEA ———, *sp. ind.*

Tablet 2523 contains the hinge portion of a shell in shape somewhat like Mactra stultorum; with most minute and crowded concentric striæ on the epidermis; inside with two slender lateral teeth, and a hinge pit near the umbo under one of them.

Hab.—Mazatlan; 1 sp. in Spondylus; *L'pool Col.*

694. ? MONTACUTA CHALCEDONICA, *n. s.*

? M. t. tenuissimâ, interdum opacâ, interdum diaphanâ, castaneâ: ovali, marginibus regulariter excurvatis, umbone pro-

* No. 685 is Tyleria fragilis, *H. & A. Ad.*

minente ; nitente, sed striulis tenuissimis, et concentricis, et radiantibus ; valvâ alterâ dent. card. post. elongato, ant. evanescente, lat. nullis ; alterâ .....

One fresh, minute, and nearly perfect valve was found, which is described because of its abnormal dentition. The texture, as seen in the microscope, closely resembles chalcedony. The nuclear umbo is whitish. *Long.* ·02, *lat.* ·028, *alt.* ·006.

Hab.—Mazatlan ; 1 valve off frond of Murex nigritus ; *L'pool Col.*

Tablet 2529 contains the specimen.

[Family ARCADÆ.]

689. Arca ———, *sp. ind. (b.)*

Tablet 2524 contains a minute valve, ·048 by ·03, swollen, with about 20 very fine rounded nodulous ribs, with the broad interstices strongly decussated.

Hab.—Mazatlan : 1 valve on Spondylus ; *L'pool Col.*

[Family PECTINIDÆ.]

690. Pecten ———, *sp. ind. (a.)*

Tablet 2525 contains 2 minute valves, broad with large ears, whitish, spotted with olive brown. The youngest, ·05 across, is capped at the apex with a Lima-shaped body, and this again with the minute oval nucleus, about ·004 across. The shape and sculpture resemble Margaritiphora, the ribs being scarcely developed, and the cellular layer conspicuous.

Hab.—Mazatlan ; 4 young fresh valves, off Spondylus ; *L'pool Col.*

691. Pecten ———, *sp. ind. (b.)*

Tablet 2526 contains a fragment of a pink shell, apparently shaped like P. varius.

Family PHILINIDÆ.

Genus SMARAGDINELLA, *A. Ad.*

Voy. Samarang, App. p. 475 :—*H. & A. Ad. Gen.* vol. ii. p. 22.
Linteria, *A. Ad.* in *Sow. Thes. Conch.* 1850.—*Woodw. Man. Moll.* p. 182.
Glauconella, *Gray, Fig. Moll. An.* pt. iv. p. 95.—*Phil. Handb. Conch.* p. 230.
Thecaphorus, *Nutt.* ms.

692. Smaragdinella thecaphora, *(Nutt.) n. s.*

S. t. axiniformi, solidâ, viridi, radiis pluribus olivaceis, sublævi; vertice juxta trientem totius longitudinis; camerâ solidissimâ, fulcro instructâ; labro postice valde producto, acute angulato; inter cameram angulamque oliwaceo-fuscâ, sinu lato, haud profundo; camerâ valde extante, rotundatâ, excavatâ, extus aperiente; labio haud reflexo; cicatricibus muscularibus conspicuis.

The excellent generic name given by Mr. Nuttall to the shell he found in the Sandwich Is. having unfortunately not been published, and therefore not being entitled to priority, it is here retained for a species differing considerably however from the Polynesian type. In the solitary Mazatlan shell, the chamber, instead of being a thin septum, not projecting, and winding spirally round inside, with a sharp, deep sutural sinus, becomes a solid spoon-shaped process, supported on a stout fulcrum from the inside, and looking remarkably like the ligamental cavity of Anatinella, &c. This chamber is open to the outside, but not within, and is separated from the very sharply angled upper lip by a shallow darkly tinted sinus. The apex, close to the junction of the chamber, is situated at about one-third of the entire length. *Long.* ·078, *lat.* ·055.

Hab.—Mazatlan; 1 fresh sp. on Spondylus; *L'pool Col.*

Tablet 2527 contains the specimen.

APPENDIX.

Species of Mazatlan shells will be found, from the Voyage of the Blossom, described in the "*Zoological Journal*," vol. iv., and in Dr. Gray's "*Zoology of Capt. Beechey's Voyage*." Several appear in the various Monographs, and especially in the "*Proceedings of the Zoological Society*." They will be seen tabulated in the Brit. Assoc. Rep. 1846, pp. 285 et seq. The following were described as new species by Philippi in the "*Zeitschrift für Malacozoologie*," 1846, pp. 19—21, 51—55, and were brought from Mazatlan by a member of his family.

1. *Corbula alba*, Phil. B. M. Cat. sp. ?30.

C. testa ovato-oblonga, tumida, æquilatera, antice rotundata, postice acuta, subrostrata et utrinque carinata, lactea, sulcis tenuibus transversis cincta. Long. 6; alt. 3¾; crass. 3½‴.

2. *Tellina cicercula*, Phil. „ ?66.

T. testa ovato-elliptica, obliqua, latere postico longiore, angustiore, purpurascente; striis perobliquis, fere perpendicularibus, antice obsoletis, postice semel fractis. Alt. 3·3; long. 3¾‴.

3. *Tellina lenticula*, Phil. „ 67.

T. testa ovato-elliptica, obliqua, albida; latere postico longiore, angustiore; striis confertis, obliquis, regularibus, haud fractis. Alt. 3¼; long. 3½; crass. 2‴.

4. *Tellina dichotoma*, Phil.

T. testa ovata, alba; latere postico longiore, angustiore, acutiusculo; striis obliquis, antice dichotomis, postice semel fractis. Alt. 3; long. 3·3‴.

5. *Tellina ervilia*, Phil.

T. testa ovato-orbiculari, subaequilatera, postice acutiuscula, alba; striis tenuibus, antice haud flexuosis, postice semel fractis. Alt. 3¼; long. 3½; crass. 2‴.

6. *Diplodonta obliqua*, Phil. „ 151.

D. testa ovata, altiore quam longa, perobliqua, laevi, solidiuscula, alba. Alt. obliqua 3½; long. 3¾; crass. 2‴.

7. *Lucina cancellaris*, Phil. „ 143.

L. testa parva, suborbiculari, subaequilatera, tumida, alba; lineis elevatis radiantibus transversisque cancellata; lunula excavata; apicibus acutis uncinatis; margine intus crenato. Alt. 2; long. 2; crass. 1½‴.

8. *Patella pediculus*, Phil. B. M. Cat. sp. 260.

P. testa parva, ovato-oblonga, depressa, costis rotundatis albis, interstiisque aequalibus nigris striatis; margine undato. Long. 6·3; lat. 4·7; alt. 1½‴.

18. *Siphonaria Lecanium*, Phil. „ 239.

S. testa ovato-oblonga: costis circa 15 rotundatis, albis; interstitiis triplo latioribus, pallide fuscis, striatis; vertice subcentrali; pagina interna fusca; margine albo. Long. 5½‴; lat. 4; alt. 1·7‴.

19. *Trochus disculus*, Phil. „ 403.

Tr. testa subimperforata, conica, basi gibba, transversim sulcata, alba, rufo punctata, nodulis acutis superne ad suturam et in peripheria cincta; columella arcuata, dente acutissimo terminata, violacea. Alt. 4·7; diam. 5‴.

20. *Buccinum nucleolus*, Phil. „ ??653.

B. testa minima, ovato-conica, longitudinaliter plicata, transversim rugosa, alba, cingulo rufo superne ad suturas, alioque in basi picta: spira conica, aperturam ovatam superante; labro extus marginato, intus dentibus decem munito; labio haud extenso. Alt. 3; diam. 2‴.

23. *Terebra fulgurata*, Phil. „ 455.

T. testa subulato-turita, longitudinaliter multangula, lævissima, albida, lineis rufis in ziczac flexis picta; fascia fusca infra suturam transluocente; suturis obsoletis; apertura fere tertiam longitudinis partem æquante. Alt. 6½; diam. 1¾‴.

24. *Columbella pallida*, Phil.

C. testa oblongo-fusiformi, transversim sulcata, albida, fascia e maculis rufis confluentibus picta; spira aperturam subsuperante; apertura oblonga, violacescente; labro fere rectilineo, intus denticulis circa 6 munito. Alt. 4·3; diam. 2‴.

25. *Columbella spadicea*, Phil.

C. testa oblongo-fusiformi, solida, longitudinaliter plicato-costata, basi transversim striata, spadicea; anfractu ultimo medio linea alba cincto; spira aperturam superante; apertura angusta, oblonga; labro intus dentibus 2-3 munito. Alt. 4½; diam. 2¼‴.

26. *Columbella tæniata*, Phil.

C. testa oblongo-fusiformi, longitudinaliter plicato-costata, costis circa 9; alba, lineis transversis rufis cincta; spira aper-

turam longe superante : labro intus incrassato, denticulis quinque munito, superne sinuato. Alt. 3½ ; diam 1·7‴.

27. *Dentalium hyalinum*, Phil. B. M. Cat. sp. 245.

D. testa tereti, subrecta, albr, hyalina, nitidissima, versus apicem tenuissime striata, versus basin lævissima ; apertura utraque simplice. Long. 11 ; lat. 1·3‴.

The only geographical list of Mazatlan shells published previously to the present catalogue, is that of Dr. Menke in the *Zeit. f. Mal.* 1847—1851. It consists of two parts ; the first, of a collection brought by Mr. H. Melchers ; the second, of another collection by the same gentleman, *with the addition of a box of purchased shells*. An analysis of both is given in the Brit. Assoc. Rep. 1856, pp. 235—239. The following are the lists, with descriptions of the new species, and references to the species in the present Catalogue.

COLLECTION I. *Zeit. f. Mal.* 1847, pp. 177—191.

1. *Siphonaria lecanium*, Phil. B. M. Cat. sp. 239.
2. *Litorina aspera*, Phil. „ 397.
3. *Turritella imbricata*, Lam. „ 380.
4. *Vermetus glomeratus*, Rouss in Chénu. „ ?355.
5. *Natica iostoma*, Mke. „ ?570.

N. testa subgloboso-ovata, longitudinaliter subtilissime sulcata, flavida ; anfractu ultimo, basi et ad suturam albido, fasciis duabus albidis seriebusque macularum fuscarum transversarum tribus, quarum media gemina, cincto ; umbilico aperto, callo conoidali spirali instructo ; fauce lilacina. Long. 8, 5, lat. 7, 3, alt. 5, lin.

6. *Natica maroccana*, Koch. „ 570.
7. *Nerita multijugis*, Mke. „ 326.
8. *Turbo fluctuosus*, Wood. „ 282.
9. *Solarium granulatum*, Lam.
10. *Cerithium ocellatum*, Brug. „ 387.
11. *Buccinum sanguinolentum*, Mke. „ 662.
12. *Buccinum gemmulatum*, Reeve. „ 661.
13. *Buccinum gilvum*, Mke. „ ?647.

B. testa ovata-oblonga, subfusiformi, nitida, lævigata, longitudinaliter plicato-costata, inferne liris decussata : costis tredecim, superne in nodulos obsoletos incrassatis ; fulvo-fusca ; anfractu ultimo in medio, spiræ conicæ anfractibus ad utrumque marginem linea alba cinctis ; apertura oblonga, labro intus dentibus linearibus paucis lirato ; columella nuda (h. e. callo destituta). Long. 7, lat. 4, lin.

14. *Terebra fulgurata*, Phil. B. M. Cat. sp. 455.
15. *Purpura hæmastoma*, Lam. „ 606.
16. *Purpura bicostalis*, Reeve. „ 606.
17. *Purpura atromarginata*, Blainv.
18. *Columbella strombiformis*, Lam. „ 616.
19. *Columbella major*, Sow. „ 615.
20. *Columbella harpæformis*, Sow.
21. *Murex brassica*, Lam. „ 668.
22. *Ficula decussata*, Reeve. „ 579.
23. *Conus achatinus*, Brug. „ 477.
24. *Oliva tergina*, Ducl. „ 596.
25. *Oliva zonalis* Lam, Ducl. „ 601.
26. *Erato columbella*, Mke.

E. testa turbinato-ovato, lævi, nitida, dorso ventricoso cinerea, extremitate utraque carneo tincta ; spira brevi ; labri margine externo incrassato, albido, posterius in angulum producto, interno denticulato, columella basi obsolete triplicata. Long. 3, lat. 2, alt. 1, 5, lin.

27. *Cypræa arabicula*, Lam. „ 438.
28. *Cypræa Sowerbyi*, Reeve.
29. *Cypræa sanguinea*, Gray. „ 442.
30. *Cypræa Solandri*, Gray. „ 441.
31. *Cypræa pustulata* Lam. „ 439.
32. *Crepidula costata*, Sow. „ ?384.

Cr. testa oblique ovata, depresse convexa, fusca, albido radiata, costis distantibus lirisque tenellis undulatis intercostalibus confertis virgata ; margine rude dentato ; vertice marginali obtuso ; septo albido, flexuoso, medio costa distincto.

33. *Crepidula hepatica*, Desh. „ ?339.

Cr. testa ovata, convexa, subventricosa, castanea vel badia,

confertim distincte porcata; vertice submarginali, acuto, marginem excedente; septo planiusculo, albido, subsinuato.

34. *Crepidula uncata*, Mke. B. M. Cat. sp. 338.

Cr. testa ovata, convexo-oblique conoidea, tenui, pellucida, pallide flavescente, lineolis longitudinalibus interruptis fuscis picta, lævi, anterius deorsum plicis radiantibus tribus aucta; vertice supramarginali. apice libero, recurvo; septo plano, prono (s. declivi), margine recto. Long. 4, lat. 3, alt. 2, 4 lin.

35. *Calyptræa dentata*, Mke. „ 343.

36. *Calyptræa imbricata*, Sow. „ 343.

37. *Calyptræa Lamarckii*, Desh.

38. *Hipponyx australis*, Desh. „ ?349.

39. *Fissurella pica*, Sow. „ 279.

40. *Fissurella chlorotrema*, Mke. „ 273.

F. testa elliptico-ovata, convexa, solidula, liris numerosis, confertis, obtusis, subæqualibus, vix nodulosis radiata, transversim striata, rufa, circum foramen lineari-oblongum rosea; cavitate cum foramine prasinis. Long. 7, 2. lat. 5, alt. 2, 5, lin.

41. *Fissurella humilis*, Mke. „ 273.

F. testa ovato-elliptica, convexa, liris inæqualibus nodulosoasperis radiata, albida, rufo-fusco virgata; foramine oblongo, in cavitate e prasino zonata annulo livido cincto. Long. 7, 4, lat. 5, alt. 2, 6, lin.

42. *Fissurella gemmata*, Mke. „ ?276.

F. testa elliptica, pyramidali-convexa, anterius depressa, albida, margaritacea, subpellucida, liris confertis obsoletis fuscis granulosis radiata: granulis rotundis, oblongis linearibusve, nigris, nitidis; foramine subcentrali oblongo, in cavitate lactea annulo roseo cincto. Long. 6, 2, lat. 4, 2, alt. 2, 5, lin.

43. *Acmæa mitella*, Mke. „ 268.

Acm. testa ovato-elliptica, conoideo-convexa, obtusa, mutica, albo nigroque dense radiata, margine integro; cavitate cineracea, fornice fusco varia. Long. 4, 5, lat. 3. 6, alt. 2, 2, lin.

44. *Pecten adspersus*, Sow.

45. *Avicula atlantica*, Lam. „ 203.

46. *Arca ?ovata*, Reeve.

47. *Mytilus*. (=M. spatula, *Mke.* in *Zeit. f. Mal.* 1848, p. 2.) „ ?170.

M. testa ovato-oblonga, recta, postice subæquilatera, antice vix cuneata, obtusiuscula ; tenui, lævi, epidermide virente-fusca, latere ventrali-antico fusco-fulva induta ; natibus incumbentibus ; ligamento tenui subrecto ; cardine edentulo ; margaro e rubido coerulescente. Long. 9, 7, alt. 4, 5, crass. 3 lin.

48. *Modiola.* (=M. semilævis, *Mke.* in *Zeit. f. Mal.* 1848, p. 5.) B. M. Cat. sp. ?? 168.

M. testa elliptico-trapezoide, supra et postice ex atropurpureo nigra ; latere ventrali angulo longitudinali obliquo superius disjuncto, epidermide fusco-flava induto, lævi, dorsali subangulato transversim striato ; area intermedia longitudinali porcis dichotomis instructa, tenuissime cancellata ; margine interno toto crenulato. Long. 6, alt. 2, 7, crass. 3, 5 lin.

49. *Cardita affinis,* Sow. „ 118.

50. *Cardium muricatum,* Lam. „ ?126.

51. *Cardium procerum,* Sow. „ 125.

52. *Donax ?compressus,* Lam.

53. *Tellina cicercula,* Phil. „ ?66.

54. *Cytherea corbicula,* Lam. „ 83.

55. *Cytherea argentina,* Sow. „ 85.

56. *Cytherea semifulva,* Mke. „ ?83.

C. testa trigona, subæquilatera, infra utrinque rotundata, umbonibus tumidis angustatis ; lævi, albida, supra glabra, limbo ventrali lato epidermide virente-fulva obtecta ; ano ovato ; intus eburnea. Long. 1 poll. 8 lin., alt 1 poll. 5, 5 lin. crass. 11, 5 lin.

57. *Cytherea chionæa,* Mke. „ 93.

C. teste cordato-ovata, lævi, sub epidermide fulva decidua cinereo-et-rufo-livente obsolete zonata, valvis medio sulcis duobus longitudinalibus latiusculis distinctis ; vulva elliptico-lanceolata ; intus alba, posterius livida. Long. 2 poll. 3, 5 lin., alt. 1 poll. 9, 5 lin., crass. 1 poll.

58. *Venus cancellata,* Linn. „ ?102.

59. *Corbula ?ustulata,* Reeve.

Collection 2. Zeit. f. Mal. 1850, pp. 161—163, 177—190; 1851, pp. 17—25, 33—38.

1. *Bulla Adamsi*, Mke B. M. Cat. sp. 224.

B. testa elliptico-ovata, solida striis longitudinalibus (s. verticalibus) tenuissimis, spiralibus nullis; umbilicata; labro medio subcoarctato; callo columellari incrassato, ad marginem soluto. Alt. 21, lat. 13 lin.

2. *Bulla nebulosa*, Gould. „ 225.
3. *Bulla (Tornatina) gracilis*, Adams. „ 222.
4. *Bulimus zebra*, Desh. „ 232.
5. *Planorbis tenagophilus*, D'Orb. „ 238.
6. *Physa peruviana*, Gray. „ 236.
7. *Litorina fasciata*, Gray. „ 400.
8. *Litorina aspera*, Phil. „ 397.
9. *Litorina modesta*, Phil. „ 396.
10. *Turritella tigrina*, Kien. „ 380.
11. *Turritella goniostoma*, Valenc. „ 379.
12. *Turritella Hookeri*, Reeve. „ P379.
13. *Vermetus Panamensis*, Rouss. „ P355.
14. *Vermetus glomeratus*, Rouss. „ P355.
15. *Natica Récluziana*, Desh.
16. *Natica glauca*, Humb.
17. *Natica marocoana*, Koch. „ 570.
18. *Natica ovum*, Mke. „ P576.

N. testa globoso-ovata, tenuiuscula; spira convexo-breve conica acuta, sutura distincta; umbilico angusto subrecto; lactea, pellucida, anfractibus 5 ad 6 convexis, superius ad suturam opaca marginatis. Long 12,5, lat. 10,5, alt. 8,3 lin.

19. *Neritina cassiculum*, Sow. „ 328.
20. *Neritina picta*, Sow. „ 329.
21. *Nerita ornata*, Sow. „ 326.
22. *Nerita funiculata*, Mke. „ 327.

N. testa ovato-hemisphærica, fusco-cinerea, nigro varia vel subzonata; spira convexa; anfractu ultimo liris confertis, lamellis brevibus confertissimis imbricatis asperis cincto; labio granoso; margine columellari medio 2- ad 3- dentato; labro intus dentato-lirato. Long. 6, 5, lat. 5, 3 alt. 4 lin.

23. *Planaxis acutus*, Mke. B. M. Cat. sp. 424.

Pl. testa fusiformi-ovata; spira breve conica, acuta; sub epidermide virente nigra, sulcata: sulcis liras acutiusculas latitudine æquantibus, in labro liris secundariis auctis; parietis aperturalis callo lineari intrinsecus decurrente. Long. 4,6, lat. 2,8 lin.

24. *Planaxis obsoletus*, Mke. „ 424.

Pl. testa ovato-elliptica; spira conica; nigra, apice rufa; sulcata, anfractus infimi late lirati sulcis exilibus; parietis aperturalis callo nodiformi. Long. 4,6, lat. 2,6 lin.

25. *Turbo fluctuosus*, Wood. „ 282.

26. *Solarium granulatum*, Lam.

27. *Euomphalus radiatus*, Mke. „ 484.

E. testa orbiculata, convexo-depressa, spira planiuscula; fusco-nigra, albo radiata; anfractibus quinque, liris conspicuis dense granulato-crenatis, confertis cinctis: ultimo rotundato, sulcis duobus latioribus juxta umbilicum patulum obsoletis; apertura circulari, peristomatis acuti marginibus callo tenui junctis. Alt. 2,4, diam. 5,5 lin.

28. *Trochus (Calcar) olivaceus*, Wood. „ 286.

29. *Trochus (Calcar) Melchersi*, Mke. „ P286.

Tr. testa breve conica; anfractibus planiusculis, costulis confertis oblique radiantibus, triplici serie transversa, quarum suprema latissima, media angustissima dispositis, costulatis, inferius, ultimo ad peripheriam depressam, undato-crenatis; facie infera striis incrementi densissimis tenuissimis sculpta, in medio cingulo semicirculari duplici granoso, in centro costa duplici laevi marginem columellarem ambiente instructa; extra pallide fusca, maculis intense rufis subradiata, infera pagina alba, juxta centrum aurantia, costa intima atropurpurea. Alt. 8, lat. 15 lin.

30. *Trochus (Calcar) stellaris*, Lam. „ P288.

31. *Trochus? minutus*, Chemn. „ P290.

32. *Trochus versicolor*, Mke. „ 289.

Tr. testa oblique conica, solida, apice acuta, anfractibus octo, medio subconstrictis, liris confertis subgranulosis, plurimis exilibus, in spira supra suturam simplici, in anfractu ultimo ad peripheriam rotundatam duplici, angulo obtuso cinctis; facie infera obsolete porcata; imperforata; columella oblique des-

cendente, planiuscula, subtruncata; apertura patula. Alt. 10, diam. 10 lin.

33. *Trochus (Monodonta) catenulatus*, Phil. B. M. Cat. sp. 401.
34. *Trochus ligulatus*, Mke. „ 293.

Tr. testa convexo-oblique conoidea, obtusiuscula, anfractibus quinque vel sex, convexiusculis, liris confertis subæqualibus argutis, granulosis cincta: granulis oblongis; squalide cinerea, nigro nebulosa; anfractu ultimo superius radiatim obsolete plicato; pagina infera convexo-planiuscula; umbilico aperto, spiraliter sulcato; columella basi sinuato-truncata: sinu medio denticulo oblongo conspicuo instructo. Alt. 5,4, diam. 7 lin.

35. *Trochus glomus*, Phil. „ P294.
36. *Scalaria crassilabris*. Sow.,
37. *Rissoa stricta*, Mke. „ 408.

R. testa ovato-oblonga; spira turrita; alba; anfractibus septem planiusculis, longitudinaliter dense costatis: costis distinctis, vicenis, validis, æqualibus, lævibus, interstitiis transverse obsolete liratis; apertura oblique elliptico-ovata, anterius juxta basin columellæ subcanaliculata; labio calloso utrinque cum labri extremitate conjuncto. Long. 3,7, lat. 1 lin.

38. *Cerithium* (Potamides) *Montagnei*, D'Orb. „ 394.
39. *Cerithium maculosum*, Kien. „ 391.
40. *Cerithium ocellatum*, Brug. „ 387.
41. *Cerithium interruptum*, Mke. „ 388.

C. testa ovato-conica, rufa, spira subturrita; anfractibus octo convexiusculis, inferioribus seriebus ternis nodulorum compressorum lirisque interjectis tenuioribus subgranulosis interruptis, in ultimo pluribus cinctis; canali brevissimo, adscendente; labro intra lirato. Long. 5,4, lat. 2,5 lin.

42. *Buccinum gemmatum*, Reeve. „ 661.
43. *Buccinum pristis*, Desh.
44. *Buccinum (Nassa) luteostoma*, Kien. „ 623.
45. *Monoceros muricatus*, Rve. „ 605.
46. *Monoceros cingulatus*, Lam. „ 583.
47. *Purpura patula*, Lam. „ 603.
48. *Purpura consul*, Lam. „ 606.
49. *Purpura biserialis*, Blainv. „ 606.

50. *Purpura bicostalis*, Lam. B. M. Cat. sp. 606.
51. *Cancellaria ovata*, Sow. „ ?445.
52. *Cancellaria cassidiformis*, Sow.
53. *Cancellaria goniostoma*, Lam. „ 446.
54. *Dolium dentatum*, Barnes.
55. *Dolium crassilabre*, Mke.
56. *Harpa crenata*, Gray.
57. *Cassis coarctata*, Wood.
58. *Cassis inflata*, Reeve.
39. *Cassis abbreviata*, Lam.
60. *Columbella harpæformis*, Sow.
61. *Columbella fuscata*, Sow. „ 617.
62. *Columbella nasuta*, Mke.

C. testa ovato-fusiformi, spira conico-turrita, acuminata; flavo-albida, infra lineis longitudinalibus flexuosis, in spira et anfractus ultimi ventricosi, infra transverse striati parte supera maculis triangularibus castaneis picta; apertura subcoarctata; columella edentula, basi producta et adscendente; labro anterius incrassato, gibbo, intra margine denticulato. Long. 9, 8, aperturæ 5,5, lat. 4 lin.

63. *Columbella fulva*, Sow. „ 648.
64. *Columbella Terpsichore*, Sow. „ ?647.

C. testa elliptico-fusiformi, utrinque acuta, fulva, fusco liturata; anfractuum margine supero, ad suturam granulato, ultimo basi transverse sulcato, supra longitudinaliter obsolete plicato; plicis nodulis protuberantibus albis coronatis; labro medio subcoarctato, intra lirato-dentato. Long. 5, 5, lat. 2, 6, lin.

65. *Murex messorius*, Sow. „ 665.
66. *Murex unidentatus*, Sow. „ ?664.
67. *Murex ternispina*, Lam. „ ??664.
68. *Murex salebrosus*, King. „ 612.
69. *Murex brassica*, Lam. „ 668.
70. *Murex bicolor*, Valenc. „ 669.
71. *Murex lappa*, Brod. „ 672.
72. *Murex dubius*, Sow. „ 673.
73. *Murex nigrita*, Phil. „ 666.
74. *Murex ambiguus*, Reeve. „ 666.

75. *Ranella nana*, Sow.
76. *Ranella muriciformis*, Bród.
77. *Ranella anceps*, Lam.
78. *Tritonium nodosum*, Mke. B. M. Cat. sp. 580.
79. *Tritonium lignarium*, Brod.
80. *Tritonium scalariforme*, Brod.
81. *Turbinella cæstus*, Brod. „ 581.
82. *Fasciolaria princeps*, Sow. „ 584.
83. *Ficula decussata*, Reeve. „ 576.
84. *Pyrula patula*, Brod. & Sow. „ 638.
85. *Pyrula subrostrata*, Gray.
86. *Pyrula anomala*, Reeve. „ 639.
87. *Fusus rheuma*, Desh.
88. *Pleurotoma funiculata*, Valenc. „ 457.
89. *Pleurotoma maculosa*, Sow. „ 458.
90. *Pleurotoma incrassata*, Sow.
91. *Pleurotoma Melchersi*, Mke.

Pl. testa fusiformi-turrita, aterrima; anfractibus superius prope suturam unicarinatis, spiræ inferius, anfractu ultimo in medio nodulorum distantium serie cinctis, hanc inter et carinam subtilissime transverse striatis, subconcavis: ultimo basi liris quinque granulosis; canali brevissimo; labro profunde inciso-sinuato. Long. 7,8 lin., lat. 3 lin.

92. *Strombus galeatus*, Swains. „ 447.
93. *Strombus granulatus*, Wood. „ 448.
94. *Strombus lentiginosus*, Lin.
95. *Strombus gracilior*, Sow. „ 449.
96. *Conus princeps*, Lin.
97. *Conus regularis*, Sow. „ 475.
98. *Conus puncticulatus*, Hwass. „ 479.
99. *Conus omaria*, Hwass.
100. *Oliva porphyrea*, Lam.
101. *Oliva angulata*, Lam. „ 590.
102. *Oliva Julieta*, Ducl. „ ?593.
103. *Oliva venulata*, Lam. „ 593.
104. *Oliva Melchersi*, Mke. „ 591.

Ol. testa cylindrico-fusiformi, supra medium obtuse angulata, abhinc ad apicem acute conica; cinereocarnea, maculis triangularibus transversis ochroleucis varia, punctis brunneis passim interspersis; anfractu ultimo ad suturam lineis fuscis fasciculatim digestis ornato; spirae anfractibus infra carneis unicoloribus, supra ad suturam fusco maculatis; labro acuto, intus vitta fusca nigro maculata marginato; columella basi longitudinaliter plicata, supra nuda; apertura intus livescente. Long. 15, lat. ad ang. 8, long. apert. 12 lin.

105. *Oliva undatella*, Lam.	B. M. Cat. sp.	595.
106. *Oliva anazora*, Ducl.	„	597.
107. *Oliva tergina*, Ducl.	„	596.
108. *Oliva testacea*, Lam.	„	602.
109. *Ovula emarginata*, Sow.		
110. *Ovula deflexa*, Sow.		
111. *Cypræa arabica*, Linn.		
112. *Cypræa arabicula*, Lam.	„	438.
113. *Cypræa (Trivia) pustulata*, Lam.	„	439.
114. *Cypræa (Trivia) sanguinea*, Gray.	„	442.
115. *Cypræa (Trivia) fusca*, Gray.	„	442.
116. *Cypræa (Trivia) subrostrata*, Gray.	„	444.
117. *Terebra variegata*, Gray.		
118. *Terebra armillata*, Hinds.	„	450.
119. *Terebra luctuosa*, Hinds.	„	454.
120. *Mitra lens*, Reeve.	„	585.
121. *Crepidula contorta*, Quoy & Gaim.	„	?340.
122. *Crepidula costata*, Sow.	„	334.
123. *Crepidula striolata*, Mke.	„	341.

Cr. testa ovato-elliptica, plano-convexa, solidiuscula, longitudinaliter dense et tenuiter striata, concentrice antiquato lamellosa: lamellarum margine membranaceo, paleaceo-lacero; apice depresso, dextrorsum curvo; sordide albida; vertice obsolete fusco radiato; intus lactea, septi convexiusculi margine repando. Long. 1 poll. 5 lin.; lat. 1 poll.; alt. 3 lin.

124. *Crepidula Goreensis*, Desh.	„	342.
125. *Calyptræa (Trochatella) Lamarckii*, Desh.	„	333.
126. *Calyptræa (Trochatella) conica*, Brod.	„	332.

127. *Calyptræa (Dyspotæa) spinosa*, Sow. B. M. Cat. sp. 344.
128. *Calyptræa cepacea*, Brod. „ 345.
129. *Hipponyx foliaceus*, Quoy & Gaim. „ ?346.
130. *Fissurella virescens*, Sow. „ 271.
131. *Fissurella viminea*, Reeve. „ ?273.
132. *Patella mexicana*, Brod. „ 259.
133. *Acmæa mutabilis*, Mke. „ 261, 264.

Acm. testa elliptica, convexa, posterius depressa, radiatim dense lirata: liris tenuibus, longitudine inæqualibus; juvenili extra rufa, intus rufo limbata; senesente extra, medio, late nigro zonata, basi paleaceo-hirsuta. Long. 1 poll. 9 lin.; lat. 1 poll. 3, 5 lin.; alt. 5 lin.

134. *Acmæa fascicularis*, Mke. „ 264.

Acm. testa elliptica, convexa, tenui, subpellucida, radiatim dense lirata et concentrice tenuissime striata; liris tenuibus, inæqualibus; alba, maculis transversis linearibus fuscis radiata: radiis posticis fasciculatis. Long. 8, 5, lat. 6, alt. 2 lin.

135. *Acmæa mesoleuca*, Mke. „ 263.

Acm. testa orbiculato-elliptica, convexa, solidiuscula, subpellucida, radiatim dense lirata: liris tenuibus, inæqualibus, transverse striatis hincque granulato-scabris, majoribus albidis; fusca, maculis radiantibus albis variegata; intus basi e fusco et albido articulata, medio zona prasina, impressione musculari fusca. Long. 13,5, lat. 11,3, alt. 3 lin.

136. *Siphonaria denticulata*, Quoy & Gaim. „ ?239.

ADDITIONS AND CORRECTIONS.

The proof sheets of this work having been submitted to several naturalists, and fresh sources of information having been obtained, during its progress, the following errors have been discovered, and additions made.* Such typographical mistakes as are at once detected, are not here noticed.

* Besides the additional specimens recorded above, "one valve" should be added to tablets 319, 542, 547, 653, 689; and "two valves" to 267, 472, 486. A small pearl, from the Spondylus washings, is added to tablet 681; "one specimen" to 786, 906, 1354, 1529, 2429; and "two specimens" to 716, 2512. On the other hand, the specimens for tablets 439, 676 and 2244 have not yet reappeared, after the various processes of packing, mounting, &c.

Page 2, *line* 11, *(et passim,) for* "Imperator," *read* "Uvanilla."

Page 7, *line* 2 *from bottom, (et passim,) for* "Spondylus Lamarckii," *read* "Spondylus calcifer."

Page 13, *line* 12, 13, *for* "in", *read* "testâ."

" " 15, *for* "pyriforme," *read* "pyriformi."

Tablet 53, *add* "also 1 fine sp. in its burrow."

Page 15, *note, line* 3. This is G. cuneiformis (Spengl.) *D'Orb.*, Martinique:—*B. M. Cat. Cub. Moll.* p. 35, no. 421.

Species 24, *Synonyms, read* " = Petricola bulbosa, *Gld. Mex. & Cal. Shells*, p. 16, pl. 15, f. 5. = Petricola sinuosa, *Conr. Journ. Ac. Nat. Sc. Phil. Jan.* 1850. Comp. Choristodon typicum, *Jonas*, in *Zeit. f. Mal.* 1844, p. 185, (St. Thomas, W. I.)"

After tablet 68, add "68*, a young sp. in situ in Spondylus calcifer, with burrows of 4 others: also a fragment of Spondylus with burrows of 3 Petricolæ and a Gastrochæna." *For* "A burrow," &c. *read* "A specimen in situ will be found on tablet 443."

Page 19, *line* 3 *from bottom.* Instead of the fragment on tablet 71 is deposited a valve since found on Spondylus of the same species. In colour and general appearance it resembles P. robusta, jun., but the radiating ribs are very much closer, when young grouped in the V pattern, and underneath shewing concentric ridges of growth. Hinge with two long posterior teeth, and a gap where an anterior tooth may have been. A very young valve is nearly smooth and transparent near the umbo; afterwards ribbed. *Long.* ·35, *lat.* ·28, *alt.* (valv. un.) ·1.

Page 21, *line* 3 *from bottom, for* "2·7," *read* ·27." The species is probably Corbula alba, *Phil.*: see page 534, no. 1.

Species 34. Corbula ———, sp. ind. (*a*), allied to Corbula scaphoides, *Hds.* Tablet 79 contains the fragments of Mr. Hanley's sp.

Page 24, *line* 9, *for* "increscentium," *read* "incrementi."

Page 25, *Insert Species* "685, TYLERIA FRAGILIS, *H. & A. Ad. Gen.* vol. ii. p. 368, pl. 97, fig. 3, 3*a*." A minute examination of the specimen has entirely removed all doubts of its unique character. The hinge tooth appears to have been of Myoid shape, but is broken. The clavicle, instead of proceeding vertically as in Periploma, &c. is curved round and supported

at regular intervals as described by Messrs. Adams. Th e drawings are copied from those of Mr. Sowerby, and appear very accurate.

Page 26, *line* 3, before "*Conr.*" insert "*H. & A. Ad.*, pars, (*Gen.* ii. 364,) non".

Species 40, *for* "SEMELE PROXIMA, *C. B. Ad.*" *read* "SEMELE FLAVESCENS, *Gld. Mex. & Cal. Shells*, p. 19:—*Proc. Zool. Soc.*, July 8th, 1856, no. 5." The shell was named from a supposed type in Mr. Cuming's collection: the real type was afterwards found in another drawer. Dr. Gould's type was taken at San Diego by *Lieut. Green.*

Species 42. *Add* "*Hab.* Panama, deep water; Payta, low water; *Cuming.*—Mazatlan; very rare, nestling in burrows of Spondylus calcifer and Chama f. Mexicana; *L'pool & Havre Coll.*"

Species 44, *add* "1837, vol. vii. p. 234, pl. 17, f. 12."

Species 46, *for* "SANGUINOLARIA PURPUREA, *Desh.*," (*which stands as a synonym.*) *read* "SANGUINOLARIA MINIATA, *Gld.* Tellina m. *Gld.* in *Proc. Bost. Nat. Hist. Soc.* Nov. 1851:—*Mex. & Cal. Shells*, p. 24, pl. 16, f. 1."

Tablet 122. Instead of the Semeloid valve, since lost, is given a sketch of the pair, taken before the accident.

Species 65 belongs to the SUBGENUS TELLIDORA, *Moerch*:—"=Tellidora Burnettii, *H. & A. Ad. Gen.* vol. ii. p. 401, pl. 104, f. 3, 3*a*."

Species 70. Iph. lævigata, *Gmel.* teste *H. & A. Ad. Gen.* ii. 407.

For Species 72, "DONAX CULMINATUS *?n. s.*" *read* "DONAX ROSTRATUS, *C. B. Ad. Pan. Shells*, no. 457, pp. 278, 321. Panama, 1 valve, *C. B. Adams.*—Mazatlan, *Lieut. Green.*—Sta Barbara, *Col. Jewett* (teste Gould) =Hecuba (Donax) culminatus, *H. & A. Ad. Gen.* ii. 405."

Page 44, *last line.* Donax flexuosus, *Gld. Cal. & Mex. Shells*, p. 21, pl. 15, f. 8, is a distinct species, most closely allied, but placed in Donax proper by Messrs. H. & A. Adams, while they include D. Californicus, D. Conradi, D. contusus, D. cultus, D. transversus, D. navicula, along with the present species, under Serrula, *Chemn.*; *Gen.* vol. ii. pp. 404-6.

After tablet 168, *add* "168* contains 1 sp. with coarse epidermis, and 1 sp. intermediate."

Species 78. *Add as synonym (from type)* "=Lutraria ventri-

cosa, *Gld. Mex. & Cal. Shells*, p. 17."

Species 80. *Add* "Comp. Mulinia donaciformis, *Gray*, in *Mag. Nat. Hist.* N. S. vol. i. p. 376:—*Zool. Beech. Voy.* p. 154, pl. 44, f. 13, 'from Nevis.'"

Species 81 *should be* "GNATHODON MENDICUS, *Gld.* Mactra mendica, *Gld.* in *Proc. Bost. Nat. Hist. Soc.* 1851, p. 88:—*Mex. & Cal. Shells*, p. 20, pl. 15, f. 4."

Species 85. *Add as synonym*, "=Cytherea æquilatera, *Desh.* in *Rev. Cuv.* 1839, p. 358:—*Mag. Zool. Guér.* pl. 22:—(Trigona æ.) *B. M. Cat. Ven.* p. 50, no. 17. San Blas." *To tablet* 246 *add* "also a smaller sp. with its velvety epidermis."

To tablet 258 *add* "also an intermediate sp. with the ribs interrupted."

Page 66, *line* 15, *add* "pl. 9, f. 1, 2."

„ 67, *line* 24, *add* "*a*, *b*, as of Lesson."

„ 70, *line* 11, *add* "*Chén. Conch. Ill.* pl. 1, f. 4, 4 *a*, 4 *b*."

„ 72, *line* 10 *from bottom, dele the reference.*

„ 79, *line* 6 *from bottom, for* "·6," *read* "·06."

Page 80, *after line* 17, *add* "?=Venus succincta, *Val. Rec. Obs.* vol. ii. p. 219, pl. 48, f. 1, *a*, *b*, *c*. Acapulco."

Page 82. *In tablet* 413, *for* "2 minute valves," *read* "1 minute valve".—The Genus Gouldia (teste Gould) is an Astarte with lateral teeth, as supposed. The West Indian Crassatella Guadalupensis, *D'Orb.* is the exact analogue of Gouldia Pacifica: his Cr. Martinicensis is intermediate between that species and G. varians.

To tablet 420 is added a minute pair measuring ·018 by ·015.

Page 87, *line* 8, *for* "f. 57" *read* "f. 5-7." Add to synonyms, "Chama frondosa, *Chén. Conch. Ill.* pl. 6, f. 8: (*var.* Mexicana) f. 7. (Do. jun. as Ch. echinata, *Brod*; apparently copied from the Transactions) pl. 6, f. 6." The true Ch. echinata appears to be figured as Ch. Delessertii, pl. 6, f. 4.

Page 90, *line* 11, *for* "Hipponyx tessellata," *read* "H. serratus."

„ 102, *before line* 5, *insert* "FAMILY DIPLODONTIDÆ."

Page 103, *line* 4 *from bottom, for* "GENUS ———," *read* "SUBGENUS FELANIA, *Récl., H. & A. Ad. Gen.* vol. ii. p. 473."

Species 154, *add to synonyms* "Comp. Poronia Petitiana, *Chén. Conch. Ill.* p. 2, pl. 1, f. 2. Callao *(Petit)*, not rare."

Tablet 498 contains, with the fragments of the broken valve, a rather larger, opposite valve, also broken. This has no cardinal tooth; the ligament remains, filling the space under the umbo; and the concentric undulations are fainter.

Tablet 503. Instead of the fragment, is a perfect valve since found, with the ligament pit normal; whether conspecific with the other valve is doubtful.

Page 115, *line* 15, *for* "irregular," *read* "regular."

Species 166, *add to synonyms*, "Comp. Anodonta glauca, *Val. Rec. Obs.* vol. ii. p. 236, pl. 50, f. 2." Dr. Gray thinks it probable that the species is an Iridina.

Page 124. *Tablet* 2530 contains a small pair of "No. 695, CRENELLA——, *sp. ind.*"; in shape somewhat resembling Modiola Braziliensis, but with the epidermis hairy on the posterior part, where it lies in radiating lines, while it is concentric on the anterior, decussated towards the middle. Found on Spondylus calcifer. *Long.* ·075, *lat.* ·03.

Page 131, *lines* 28, &c., *read* "Tablet 605 contains the original sp. of Leiosolenus spatiosus, presented by R. D. Darbishire, Esq. One since found measures *long.* 2·3, *lat.* ·7, *alt.* ·7.

Species 184, *add to synonyms*, "Var. ? = Arca trapezia, *Desh.* in *Rev. Cuv. Soc.* 1839, p. 358:—*Guér. Mag. Zool.* 1840, pl. 21. San Blas."

Page 148, *last line, &c., for* "Discoporæa" *read* "Defrancia."

Species 204 *should stand as* "MARGARITIPHORA FIMBRIATA, *Dkr.* Avicula (Meleagrina) fimbriata, *Dkr.* in *Zeit. f Mal.* 1852, p. 79, no. 13. Central America."

Species 212. Ostrea Canadensis is distinct, teste Gould.

Species 214, *b*. The examination of additional specimens confirms the opinion that OSTREA PALMULA is a distinct species.

Species 220 is probably a Naranio: See page 529.

Page 176, *line* 8 *from bottom, after* "f. 1," *add* "*a, b.*"

,, 177, *line* 3 *from bottom, add* "p. 247, pl. 56, f. 1, *a, b.*"

Species 240. *Add* "= Siphonaria æquilorata, [*Rve.* quasi] *Gray* ms., *Rve. Conch. Ic.* pl. 4, sp. 15, f. 15 *a, b. Vide* Brit. Assoc. Rep. 1857, p. 290, *note* *."

Species 242. *Add to Hab.* "Sandwich Islands, *Nuttall.*"

Species 255 *should be* "MAC-ANDREÆ."

Page 199, *dele* line 2 from bottom. Dr. Gould's shell is the

Acmæa grandis, *Gray*, found at Monterey by *Col. Jewett* and *Mr. Hartweg*. It appears abundantly in the S. W. Mexican Col. but was not found either by Mr. Nuttall or M. Reigen. *Dele* also the corresponding reference under *Hab. (page* 200) "Monterey.....*Nutt.)*"

Page 203, *line* 22, *add* "(Non *Rve. Conch. Ic.* pl. 16, sp. 38, 1854.)"

Page 207, *line* 9 *from bottom.* D'Orbigny's types in the Br. Mus. appear exactly conspecific with the Californian shells.

Page 208, *line* 2, *for* "? +" *read* "=." Add to the sentence, "teste Reeve: 'never took it,' teste *Cuming*: Monterey, *Hartweg*, teste Mus. Cuming."

After tablet 1020, *add* "1020 *bis*, 1 sp. with 6 corners."

Page 215, *last line, add* "*Chén. Conch. Ill.* pl. 1, f. 25, *a, b.*"

„ 216, *last line (text,) for* "13" *read* "·13."

Page 220, *line* 9 *from bottom, add* "*Chén. Conch. Ill.* pl. 1, f. 23, 24." *To the synonyms should be added* "? + Fissurella mus, *Rve. Conch. Ic.* pl. 16, f. 120. Hab. ?——"

Page 227, *line* 17, *to Val. Voy. Ven. add* "pl. 2, f. 3, 3 *a-c.*"

To tablet 1095, *add* "Most of the above possess opercula; tablet 1095* contains 6 opercula loose."

Page 229, *line* 2 *from bottom, add* "*Rev. Soc. Cuv.* 1839, p. 361."

„ 229, *last line, add* "pl. 2, f. 2, 2 *a.*"

„ 230, *note, line* 2, *to* "*Voy. Ven.*" *add* "pl. 3 f. 1, 1 *a-c.*"

„ 232, *line* 1, *for* "Comp." *read* "=," from type.

To tablet 1125, *add* "one with operculum."

Page 235, *line* 3, *dele* "?" from type.

To species 329, *add the following note** :—

* An extremely similar species, with the colour-markings preserved, is found in the Lias of N. Germany; Neritina Liassina, *Dkr.* in *Zeit. f. Mal.* 1844, p. 188.

Page 263, *line* 5, *for* "has" *read* "had".

Tablet 1425. The specimen recorded proves to be somewhat less elongated than that on tablet 1424. Another specimen is therefore substituted, intermediate in shape, finely striated longitudinally, with crowded ridges of growth.

After tablet 1445, *add* "1445*, 2 sp. extremely young, of which one may have developed into C. imbricatum."

Tablet 1516, *add* "+ a young shell which may belong to the species."

Page 332, *line* 16, *for* "Comp." *read* "=" from type.

After tablet 1683, *add* "1683 *b*, 6 sp. spire somewhat elevated."

Page 352, *line* 4 *from bottom, add* "Taboga, rare, *C. B. Adams.*" The specimens collected by *Eydoux & Souleyet* were probably South American.

Page 358, *dele lines* 6-10; *and read* "GENUS BARLEEIA, *Clark*:—*H. & A. Ad. Gen.* vol. i. p. 332. Species 411. BARLEEIA LIRATA, *n. s.*" Only one species of the genus had before been described, viz. Barleeia rubra, *British.*

Page 360, *line* 2 *from bottom, for* "?=" *read* "Non," teste A. Adams.

Page 388, *beginning of line* 15, *insert* "Terebra fulgurata."
„ 402, *line* 5, *insert* "? Non" *before* "*Rve.*"
„ 450, *line* 10 *from bottom, read* "2 sp."
„ 450, *line* 4 *from bottom, read* "·03 long."
„ 451, *line* 15, *for* "perfect" *read* "larger": the other is lost.
„ 451, *line* 2 *from bottom, read* "*Lat.* ·055."
„ 479, *line* 5 *from bottom, (text,) for* 2547 *read* 2247.

Page 481. *Dele* the whole paragraph commencing "Tablet 2252," &c., which (by some unaccountable oversight) has been compounded from tablets 2230 and 2231 in page 477.

Page 491, *line* 2 *from bottom, (text,) dele* "also loose opercula;" the loose opercula not being separable from those of C. major.

Species 625. The Nassa (Triton) pagodus of *Rve.* is not to be found in the Cumingian Collection, although it is given as brought by Mr. Cuming from the Bay of Montija. Its identity or otherwise with the present species must therefore remain in doubt.

In tablet 2433, *dele* "4".

Page 515, *after tablet* 2445, *add* "2446, 3 sp. shewing colour."

Page 515, *line* 11, *dele* "(?PAGODUS, *var.*)" On comparison of types, the Pisania pagodus, *Rve.* appears quite distinct.

Page 545 *no.* 125, Comp. *Desh.* in *Lam. An. s. Vert.* vol. vii. p. 627, no. 9:—=Trochus calyptræformis, *Lam.* in *Deless. Rec.* pl. 34, f. 7. *Hab.* New Holland.

P. P. Carpenter, Oberlin Press, Warrington.

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